UPDATE OF

A PEAT RESEARCH DIRECTORY

FOR CANADA

Contract No. 040-708/3201, National Research Council of Canada.

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AUTUMN 1984

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ACKNOWLEDGEMENTS

This directory would not exist if it had not been for the considerable help and advice received from many quarters. Too many people have helped for them all to be mentioned. Some however, stand out too much to be left unacknowledged: especially the vision and inspiration of Dr. Cockshutt and Dr. Overend at NRC in initiating this project; Ted Tibbetts, for his many dedicated years to the development of Canadian peat technology: with CANMET in Energy Mines and Resources, more recently, NRC Peat Program Manager, and also for his continued belief in and support of this Directory. Jean McNulty at NRC Division of Energy; Jane Reagan at Supply and Services Canada (SSC); Dorothy Evans, Doug Dewar, and most recently, Dianne Chiasson at the Canada Institute for Scientific and Technical Information (CISTI); and Jocelyn Lillycrop at Natural Sciences and Engineering Research Council (NSERC) have all been very helpful in providing access to information for project data sheets and the various bibliographic as well as funding references. Cathy Hagarty and Jennifer Hayman with earlier editions, as well as my sister Carol Collins with the present update, helped with the typing. Linda Maltby, Jane Murray, and most recently, Janis Webb, helped with the compilation and other aspects of production.. These, however, are only some principal figures in what has truly been a national collaboration. Although this work has been funded by the National Research Council of Canada and has been carried out with diligence to maintain accuracy and to provide a meaningful service, the reading user may find omissions or errors. These are solely the responsibility of the contractor and, to the extent that some are inevitable in a work of this nature, please accept my apologies in advance. It is nevertheless hoped that the following will be of overall assistance. This Peat Research Directory is dedicated to those striving to maintain integrity and provide service to others in the peat research field with a view towards wiser future utilization of Canada's important peatland resource.

Sincerely,

Jim Collins.

ABBREVIATIONS

Aero Stds - Aerospace Studies
Agri - Agriculture
Biochem - Biochemistry
CDA - Agriculture Canada
Chem - Chemical
Civ - Civil
DRB - Defense Research Board
EMR - Energy, Mines and Resources
Eng. - Engineering
ENV - Environment Canada
CWS - Canadian Wildlife Service
Geolog - Geological
Geotech - Geotechnical
Land Res. Sce - Land Resource Science
Mech - Mechanical
NRC - National Research Council of Canada
NSERC - Natural Sciences Engineering Research Council
Ped - Pedology
Sci - Science(s)
SSC - (on behalf of X) - Supply and Services Canada let contract for Department X
SSHR - Social Sciences and Humanities Research Council

INTRODUCTION

This Peat Research Directory is an update of the directory published by the National Research Council in 1982. While to some extent the project data sheets contained herein are more representative than a complete description of all peat research now being undertaken in Canada, it is hoped that they, together with the bibliographic references also provided, will nevertheless prove useful to those involved in either the research or policy responsibilities of Canada's peat and peatlands. The purpose of this directory is to try to draw together into one co-ordinated reference source, representative efforts and the accomplishments of those researchers and specialists who are or have been working with Canada's peatland resource. The emphasis here is especially on the inventory and utilization of peat as energy and chemical feedstock.

Solely in terms of land area, peat covers some 10 to 20% of Canada. Although the precise extent of this vast resource is much better realized than a few short years ago, there are many areas which still remain to be adequately surveyed. While New Brunswick still has the most comprehensive inventory of its peatland resource, Newfoundland, Quebec, Nova Scotia, and Ontario have made great strides as well in assessing accurately their resource base. Other provinces have made significant inroads also. Besides surveys specifically addressed to peatlands, wetlands maps and soil surveys give some, although inadequate, indication of peat areas across all of Canada.

It should go without saying that peat is an important Canadian resource. However peat has often been traditionally described as "muskeg" as well as other less than flattering terms. Since it does not fall directly within the concern of any one scientific or engineering discipline, systems of semantics and methodology tend to vary considerably between researchers. Lines of communications between researchers in different fields have often simply not existed. Further, government departmental jurisdictions - both federally and provincially - have tended to be established along the lines of conventional academic disciplines, no one agency can be found responsible for policy or for carrying out all the research related to peat which is now going on in Canada or which has been conducted in the past. It appears evident that Canada and Canadians have tended to overlook much of the potential of this resource as a result.

The Peat Technical Working Group (PTWG) of the Interprovincial Advisory Committee on Energy (IPACE) was established in 1982 to facilitate co-operation and co-ordination of peatlands work in Canada. This was indeed a significant initiative. The Working Group reports to the Conservation and Renewable Energy Co-ordinating Committee (CRECC) of IPACE. Like other working groups, the Peat Technical Working Group is intended to assist the IPACE co-ordinating committee on technical matters and to provide a forum for the exchange of ideas by researchers. Peat is here considered as a type of biomass, although strictly speaking not renewable. In terms of inventory and utilization, peat is very similar to the biomass resources. Further, the federal program, at least, has been very much dedicated to ensuring that an adequate knowledge base exists for harmonizing peat development with appropriate safeguards for environmental protection, in keeping with the concerns of ecology.

Several provinces have adopted energy policy stances which give peat a low profile as far as energy research and development is concerned. Primarily this is because of the existence of other, more valuable sources of energy. There is often a further reason for a lack of emphasis on peat however: traditionally peat has seldom existed as an area of concern in the research or administrative efforts of provincial energy departments. Some provinces, such as New Brunswick, have responded to the IPACE challenge by nominating knowledgeable people from their Mines Branch to the PTWG. Others such as Ontario have worked to combine and integrate the concerted efforts of those working in various provincial departments. Most provinces consider that there is some prospect for energy and or chemicals from peat. Often as part of a holistic development policy, such leaders are interested in obtaining a more complete inventory of their province's peat resource as well as some practical demonstration of its energy capability. All provinces of Canada have expressed an interest in developing better communications concerning peat-related state-of-the-art research and development.

In general, it can be assumed that provinces are more oriented towards development and demonstrations, while federal agencies are more concerned with basic research. Since peat is a particularly nascent area for Canadian technological innovation, a great deal of co-operation is required for any truly viable research and development to occur. This is even more true in the present restricted economic situation. The inherited problems of semantics, methodology, jurisdiction, and mandate make the need for concerted efforts towards co-ordination and co-operative programs imperative. This is true at all levels - not only between provinces and the federal government, but also within various branches and departments of federal and provincial government, and simply with individuals. It is sometimes erroneously stated that if there could only be one lead agency or group managing all the peat research and development in Canada, things would be happening in a much more effective and productive manner. The truth is that peat is a regional resource about which no one discipline knows all there is to know, and over which no one agency has complete and comprehensive jurisdiction. Most effective utilization of the talents, capabilities, knowledge and services which are "in place" and/or developed - be they individuals or agencies - can best be achieved through mutual respect, assistance, co-operation and simple courtesy. This truth is evident to many and is responsible for much of the good work which has already been accomplished.

The many efforts on the part of those in the PTWG, the NRC Peatlands Subcommittee, and the Peat Forum are important examples of this respect, assistance, co-operation, and courtesy. Formerly the NRC Muskeg Subcommittee, the Peatlands Subcommittee of the NRC Associate Committee on Geotechnical Research has co-ordinated considerable Canadian peat research since the Second World War. This work is continuing. The federal government Peat Forum was established in late 1981 to foster co-ordination of peat research at the federal level: with membership from a wide variety of departments and departmental branches including Agriculture Canada, Energy Mines and Resources, Environment Canada, Indian and Northern Affairs, and the National Research Council.

The project data sheets for this update have been prepared on peat-related projects which are or have been carried out in Canada or by Canadians. Research has been and is being done by scientists and engineers at the federal and provincial levels of government as well as in universities and private companies. Part of the process of information gathering has included surveys and requests for information by mail, telephone, and personal interview. The project data sheets constitute a formal presentation of a representative fraction of what has been going on in recent years as well as earlier work which has been updated or is otherwise still relevant. These data sheets are organized according to nine different Peat Research Sub-Program Identification categories which are listed below. In general, reports listed on project data sheets should be available on loan from the NRC Division of Energy Library or CISTI.

The Bibliographic section (VI), starting at page 305, is also organized according to the same nine Peat Research Sub-Program Identification categories. It is largely the output of a comprehensive computer literature search carried out by CISTI covering entries over the past two years, under a variety of English and French key words, over a wide range of data bases.

For more specific information it is recommended that CISTI be contacted directly,

Reference Department,
Canada Institute for Scientific and
Technical Information,
National Research Council of Canada,
Ottawa, Ontario.
K1A 0S2

(613) 993-2013
Telex: 053-3115
Envoy 100: CISTI.REF

PEAT RESEARCH SUB-PROGRAM IDENTIFICATION KEY

4.6.1 PEAT RESOURCE INVENTORY

This activity includes the determination of the availability, quantity, quality, and type of peat as well as the method by which this availability is measured.

4.6.2 PEATLAND MINING

Developments in methodology and the technology used for bringing virgin peatland into production, and developments in the science and engineering associated with the extraction and handling of peat are being studied.

4.6.3 PEAT DEWATERING/PROCESSING, COMBUSTION AND CONVERSION TECHNIQUES

A virgin peat bog contains about 97% water and 3% peat solids, by weight. A drained bog yields 92% moisture peat. To use peat as a fuel, the moisture content is reduced below 55%. Various technologies are being investigated to accomplish this reduction. Involvement in medium and large scale chemical and gas production from Canadian peat through possible joint venture activities is also a consideration.

4.6.4 ENVIRONMENT

Reclamation strategies, environmental protection criteria, the ecology of wetlands and studies as to how bogs and fens interact with their environment are being addressed.

4.6.5 PRODUCT DEVELOPMENT AND STANDARDS

The discovery and trial of new methods of characterizing and processing peat; research to improve and develop novel methods (technologies) of converting mined peat into a more effective, more marketable commodity for energy production; work to develop proven peat science into viable Canadian industrial processes and to upgrade existing industry practice through the application of scientific and engineering research are included in this activity.

4.6.6 PROGRAM MANAGEMENT AND INTERNATIONAL ACTIVITIES

Organizational infra structure is a necessary component of effective research and development.

4.6.7 PEATLAND TRANSPORT

To improve mobility on peatland areas and enhance thereby the economics of operation on peat terrain; and research to minimize adverse environmental impact are or will be addressed.

4.6.8 IN SITU USE

Energy and valuable resources can be conserved through effective "in situ" utilization of peatlands.

4.6.9 TECHNICAL AND ECONOMIC STUDIES

The assessment of existing and developing technology and its potential to transfer to Canadian social and economic environments is a significant component of the Program.

PROJECT DATA SHEETS

PEAT RESOURCE INVENTORY

Determination of the availability, quantity, quality, and type of peat as well as the method by which this availability is measured.

TITLE Peatland Inventory Methodology Workshop

CONTRACT # **COST** $20,000

ORGANIZATION Land Resource Research Institute,
Agriculture Canada,
K.W. Neatby Building,
920 Carling Ave.,
Ottawa, Ontario,
K1A 0C6

PRINCIPAL INVESTIGATOR Charles Tarnocai and Dr. Fred Pollett
(613) 995-5011

DURATION March 9-10, 1982.

SPONSOR Federal Government Peat Forum

SCIENTIFIC AUTHORITY Dr. J.S. Clark,
Land Resource Research Institute,
Agriculture Canada,
K.W. Neatby Building,
920 Carling Ave.,
Ottawa, Ontario.
K1A 0C6 (613) 995-5011

OBJECTIVE

1) To describe the inventory methodologies now being utilized.

2) To list the kinds of data being obtained.

3) To determine (wherever possible) the extent and nature of inventory and mapping completed or in progress.

4) To identify the major geographic areas of Canada for which basic peat resource data are lacking.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	CDA		$20,000.

DESCRIPTION

Papers presented included:

Ted Tibbetts - Introduction Forum Program;
Steve Zoltai - Peatland Surveys in the boreal forest region
D. Olson - Peatland inventory methodology used in soil surveys
R. Fulton - Mapping of peat deposits in geological surveys
Fred Pollett, Doyle Wells, and Ed Dawe - Peatland Inventories for Newfoundland: methodology and application
Gord Mills - Peatland inventories in Manitoba;
Peter Telford - Peatland inventory program of the Ontario Geological Survey;
Dave Moon and Corrine Selby - Computer-assisted wetland classification and inventories in B.C.;
Dave Keys - Summary of techniques used in the inventory of New Brunswick peatlands;
A. Boissonneau, D. Cowell, and J. Jeglum - Hudson Bay Lowland peatland inventory;
Clay Rubec and J. Moore - Prime lands, wetlands;
Guy Gilbert - Update on the Quebec peatland inventories;

Methodology of Future Peatland Studies:

Doyle Wells and Harry Hirvonen - Study of peatlands in Labrador;
Charles Tarnocai - Study of peatlands of the St. Lawrence Lowlands and the Pacific Coast: methodology.

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STATUS AND COMMENTS

Report proceedings published by LRRI and the Newfoundland Forest Research Centre.

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REPORTS

Proceedings of a Peatland Inventory Methodology Workshop, Ottawa, Ontario, March 9-10, 1982., 13 papers, Published by Land Resource Research Institute, Agriculture Canada, Ottawa, and Newfoundland Forest Research Centre, Environment Canada, St. John's, 1983. Copies are available by contacting the NRC Peat Program Manager, Ted Tibbetts, c/o National Research Council of Canada, Atlantic Laboratory, 1411 Oxford Street, Halifax, Nova Scotia, B3H 3Z1.

TITLE The Organic Soils of Vancouver Island

CONTRACT # **COST**

ORGANIZATION Agriculture Canada Research Station,
P.O. Box 1000,
Agassiz, British Columbia,
VOM 1AO.

PRINCIPAL INVESTIGATOR E.F. Maas; (604) 794-7764

DURATION

SPONSOR Agriculture Canada

SCIENTIFIC AUTHORITY Agriculture Canada Research Station,
P.O. Box 1000,
Agassiz, British Columbia
VOM 1AO

OBJECTIVE

To characterize organic soils on Vancouver Island according to chemical and physical analysis. Land use is designated under one of three headings: cultivated, virgin, and seeded/improved pasture.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

- chemical and physical analyses were conducted, at the Research Station in Sydney, B.C., on samples from most of the organic soils in the farming areas of Vancouver Island.

- cultural and fertility experiments on representative cultivated and pasture fields were carried on at the same time.

- a report describes the organic soils and relates them to their management and fertility requirements, gives analytical data profile descriptions and management problems of soils from each farm, and indicates soil classification and land use designation.

STATUS AND COMMENTS

Study completed.

REPORTS

The Organic Soils of Vancouver Island, Contribution No. 231, Agriculture Canada, available from Agriculture Canada Research Station, P.O. Box 1000, Agassiz, B.C., V0M 1A0. Author can be contacted directly at 50258 Yale Rd. E., R.R. 2, Chilliwack, B.C., V2P 6H4.

TITLE Resource Base Inventory - Peat Fuel

CONTRACT # No. C-316 **COST**

ORGANIZATION L.J. Rak Engineering Limited,
117 Disco Road,
Rexdale, Ontario,
M9W 1M3.

PRINCIPAL INVESTIGATOR 'L.J. Rak, P.Eng., (416) 675-0160

DURATION 1983-1985

SPONSOR Peat Resources Limited

SCIENTIFIC AUTHORITY Mr. L. LaPrairie, P.Eng.,
Peat Resources Limited,
Suite 1105, 347 Bay Street,
Toronto, Ontario.
M4H 2R7 (416) 862-7885.

OBJECTIVE

Evaluation of the potential resources of peat fuel in Northern Ontario, over an area comprising approximately 230,000 hectares, for which work permits have been obtained from the Ministry of Natural Resources.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

The following is a brief statement of information requirements to evaluate the quantity and quality of the peat resources:

- determine extent and depth contours of bog as a whole, and evaluate the drainage regime

- classify and subdivide the bog into "grades" of peat (based on visual and manual examination e.g. floristic constitution, structure and degree of humification)

- calculate quantities of each graduation of peat type

- establish quality of each grade in more detail by laboratory testing (e.g. calorific value, moisture content, ash, sulphur contents, etc.).

STATUS AND COMMENTS

A confidential report for Peat Resources Limited is underway.

REPORTS

TITLE Prairie Region Peat Classification Survey - Wetland Ecology Programme.

CONTRACT # **COST**

ORGANIZATION Northern Forest Research Centre,
Environment Canada,
5320 - 122 Street,
Edmonton, Alberta
T6H 3S5

PRINCIPAL INVESTIGATOR S.C. Zoltai; (403) 435-7304.

DURATION 1981 and continuing.

SPONSOR Environment Canada - Peat Forum.

SCIENTIFIC AUTHORITY Mr. D. Kiil,
Regional Director, Forestry,
Northern Forest Research Centre,
5320 - 122 Street,
Edmonton, Alberta.
T6H 3S5

OBJECTIVE

To investigate the developmental dynamics of the peatlands in the Boreal Regions of Alberta, Saskatchewan, and Manitoba. Devise a peatland classification system suitable for inventory of peat resources, or peatlands as enhanced biomass production sites.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Beginning in 1981, 55 to 75 different peatlands were investigated in Alberta, central Manitoba, Southern Manitoba and central Saskatchewan. In the field the peatlands are cored and sampled in detail, and the vegetation cover is examined in detail. In the laboratory 13 elements are determined, and related to other chemical and physical properties of the peat. The macrofossil components of the peat samples are determined. Radiocarbon ages of selected samples are obtained. The developmental dynamics of the peatlands are related to chemical composition of peat, inferred hydrologic conditions throughout its history, and to vegetation changes.

STATUS AND COMMENTS

Field work and data collection is largely completed. Analyses of the data, and reporting will take place in 1984-86.

REPORTS

TITLE Nova Scotia Peatland Inventory

CONTRACT # In-house **COST** $500,000

ORGANIZATION Nova Scotia Department of Mines and Energy,
1690 Hollis Street, P.O. Box 1087,
Halifax, Nova Scotia,
B3J 2T3

PRINCIPAL INVESTIGATOR A.R. (Sandy) Anderson, Wayne Broughm,

DURATION On-going

SPONSOR Nova Scotia Government and
Energy Mines and Resources, Canada.

SCIENTIFIC AUTHORITY Kevin Gillis,
N.S. Dept. of Mines and Energy,
P.O. Box 999,
Stellarton, N.S.
(902) 752-8429.

OBJECTIVE

1) To determine the extent of Nova Scotia peatland resource.

2) To determine the extent of the fuel resource in these peatlands.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1980		Province	
1981		Province	
1982		Province	
1983		Province	$125,000

DESCRIPTION

The program utilizes a grid system and "spot" sites to determine the physical attributes of the peat deposits.

A system of site analysis consisting of:
1) Von Post Humification
2) Peat Types
3) Radforth, Jeglum Boisseneau site classification
4) Surface elevations

provides data on bog depth and volume plus specific information on the volume of the various peat in each deposit inventoried.

Program directed to the peat deposits located within several peatland concentration areas that are near various local industries.

STATUS AND COMMENTS

The field program is in its fourth year. Field work is being carried out in Cape Breton with some additional field work being carried out in southern Nova Scotia relating to a peat feasibility study.

REPORTS

1) "Preliminary Assessment of the Peatland Resources of Southwestern Nova Scotia." In-house report.

2) "Preliminary Resource Data Moose River Gold Mines Peatland Area" (J28-1, 1a, 1b, 1c, 1d). In-house report.

3) Peatland Inventory Program 1981. In-house report

4) Report - HANTS County 1982. In-house report.

5) Report - Kirap County 1982. In-house report.

6) Peatland Inventory Program - Report of Activities. 1983.

TITLE A survey of Peatlands near Foleyet, Ontario

CONTRACT # **COST** $168,053

ORGANIZATION Dendron Resource Surveys Ltd.
880 Lady Ellen Place, Suite 206,
Ottawa, Ontario,
K1Z 5L9

PRINCIPAL INVESTIGATOR Paul V. Tomascik (613) 725-2971

DURATION Aug. 1983 - Feb. 1984

SPONSOR Ontario Geological Survey, Ont. Min. Natural Resources

SCIENTIFIC AUTHORITY Mr. J.L. Riley,
Engineering and Terrain Geology Section,
Ontario Geological Survey,
Room 725, 77 Grenville St.,
Toronto, Ontario.
M5S 1B3 (416) 965-1183

OBJECTIVE

1) To carry out reconnaissance field investigations of all designated peatlands, in order to assess or confirm which sites should be studied in detail.

2) To carry out detailed field investigations of a designated number of peatlands, to evaluate the peat type and peat humification stratigraphy, peat volumes, elevations, drainage, and surficial vegetation.

3) To subdivide and map all designated peatlands on the basis of air photo interpretation and field work.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	$168,053		$168,053

DESCRIPTION

During the summer of 1983, Dendron Resource Surveys Ltd., under contract to the Ontario Geological Survey, carried out a peatland inventory in the area of Foleyet, Ontario. Six detailed study sites and ten reconnaissance study sites were surveyed. All of the above objectives were reached.

STATUS AND COMMENTS

Completed.

Detailed reconnaissance and remote sensing studies of peat and peatland resources of Ontario south of 51 degrees north, have been underway since 1982 (continuing until 1986) and have been sponsored by the Board of Industrial Leadership and Development. Focussing was on large and accessible peatlands for detailed study of peat stratigraphy, deposit configuration volumes, peat chemistry and physical characteristics, peat types and humification levels, surficial vegetation, etc. Completed by consultants working to detailed standard specifications. All reports published by O.G.S. 99000 ha. of peatland studied in detail 1982-84, 94000 ha. at reconnaissance level. Other consultants hired include Gartner Lee Associates Ltd. (inventory of Kingston-Belleville area, 1983); Northland Associates Ltd. (inventory of Rainy River area, 1983); Proctor & Redfern Ltd. (inventory Ignace area, 1983) and Three-D Geoconsultants Ltd.

REPORTS

Three volumes, including maps: Open File Report No. 5490 of the Ontario Geological Survey.

TITLE Ontario Peat Inventory Program.

CONTRACT # In-house **COST** $750,000.

ORGANIZATION Ontario Geological Survey,
Ministry of Natural Resources,
Room 706,
77 Grenville Street,
Toronto, Ontario.
M5S 1B3

PRINCIPAL INVESTIGATOR To be hired.

DURATION On-going since 1981.

SPONSOR Ontario Government Board of Industrial Leadership and Development.

SCIENTIFIC AUTHORITY Dr. Peter Telford,
Ontario Geological Survey,
Ministry of Natural Resources,
Room 706,
77 Grenville Street,
Toronto, Ontario.
M5S 1B3 (416) 965-1183.

OBJECTIVE

To promote the development of peat resources in Ontario. To define the resource base and thereby promote development. The Ontario Peat Resource Inventory Program is part of the Ontario Hydro-Carbon energy program in the Ministry of Natural Resources. Most bogs are crown-lands in Ontario. Revision to the mining act has recently been made, requiring a special permit to develop peat: thus reserving peat to the crown. This is an attempt to stop speculation on peat reserves.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82	$750,000.		$750,000.
1982-83	$800,000.		$800,000.
1983-84	$1,000,000.		$1,000,000.

DESCRIPTION

Work has been undertaken in the past eg. a study conducted by R. Bruce Graham and Assoc. Ltd. in 1979 and very much earlier (eg. Peat Committee (Canada and Ontario) 1918-1923) but the program is now being reorganized in particular to reflect fuel peat potential. Montreal Engineering (MONENCO) was hired in March 1981 to propose a comprehensive program for peat in the province of Ontario. A trip has been made by Ontario exploration crews to the Finnish Geological Survey to learn their bog inventory techniques. Contact has also been made with Newfoundland and New Brunswick to study their inventory techniques. Exploratory work in future will be likely enhanced by LANDSAT remote sensory imagery: finalization of plans will be largely based on Monenco study recommendations. This recont study was commenced in March 1981 at a cost of $111,000.

Three areas were inventoried by the Ontario Centre for Remote Sensing in the winter of 1981-82: N.W. of Timmins, N.E. of Sioux Lookout, and N.W. of Thunder Bay. In 1982-83 some three areas are being inventoried. The area N.W. of Timmins was ground-truthed in the summer of 1981. Also, as intensive ground-assessment traverse of a major part of the bogs to test the effectiveness of the remote sensing methodology was done. Remote sensing analysis of 5 - 6 areas will be carried out this summer - several in northern Ontario and several in S.E. Ontario, as well as the Galbraith bog area surveyed by OMNR in the summer of 1981.

STATUS AND COMMENTS

The Ontario Peat Inventory Program is represented to the IPACE (Interprovincial Advisory Committee on Energy) Peat Technical Working Group by Peter Telford, who is also chairperson of the Ontario Interministerial Committee on Peat. (ICOP)

1982/83 - 3 areas surveyed, 50,000 km2.
1983/84 - 7 areas surveyed, 100,000 km2.

REPORTS

- "An Evaluation of the Potential of Peat in Ontario". Monenco Ont. Ltd., Ontario Ministry of Natural Resources, Occasional Paper #7, 1981, (350 p.), $20.00.

- "Some Peat Moss and Peat Deposits in Selected Areas - Districts of Nipissing, Sudbury, Algoma, Thunder Bay, and Kenora". Dr. R. Bruce Graham, Ontario Geological Survey, #19 Ontario Ministry of Natural Resources, Toronto, 1979, 132 p.

- Peat: It's Manufacture and Uses. Benjamin F. Haanel, publ. jointly by Mines Branch, Dept. Mines Canada and Dept. Mines Ontario. Final report of the Peat Committee appointed jointly by the governments of Ontario and Canada, King's printer, Ottawa 1926, 298 p. illustrated w. plates 4 page bibliography and forward signed by Arthur Cole.

- Open File Reports of the Ontario Geological Survey (on file at OGS Library and Regional Geologist's offices of MNR)

Peterborough	area,	OFR#	5448
Pembroke	"	"	5449
Hearst	"	"	5450
New Liskeard	"	"	5486
Ignace	"	"	5487
Parry Sound	"	"	5488
Rainy River	"	"	5489
Kingston-Belleville	"	"	5490
Ottawa- Brockville	"	"	5491
Foleyet	"	"	5492

TITLE A Survey of Peatlands near Hearst, Ontario

CONTRACT # **COST** $ 120,000

ORGANIZATION Dendron Resource Surveys Ltd.,
880 Lady Ellen Place, Suite 206,
Ottawa, Ontario K1Z 5L9

PRINCIPAL INVESTIGATOR Paul V. Tomascik (613) 725-2971

DURATION Sept. 1982 - Feb. 1983

SPONSOR Ont. Geological Survey, Ont. Min. of Natural Resources

SCIENTIFIC AUTHORITY Mr. J.L. Riley, Engineering and
Terrain Geology Section,
Ontario Geological Survey,
Room 725, 77 Grenville St.,
Toronto, Ontario.
M5S 1B3 (416) 965-1183.

OBJECTIVE

1) To carry out reconnaissance and detailed field investigations of designated peatlands, and to evaluate their peat type and peat humification stratigraphy, peat volumes and elevations;
2) To produce classification maps of peatlands throughout the study area, and interpret the corresponding aerial photographs.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	$120,000		$120,000

DESCRIPTION

In 1982 the Ontario Geological Survey, began a series of major peatland inventories. Hearst was one of the four projects completed during the first year of the program, and all of the above objectives were met.

STATUS AND COMMENTS

Completed.

REPORTS

Two volumes, Open File Reoprt 5450 (Ontario Geological Survey), under title of Peat and Peatland Evaluation of Hearst Area.

4.6.1 PEAT RESOURCE INVENTORY JAC 28/5/84

TITLE Mapping of the Wetlands of the Hudson Bay/James Bay Lowlands.

CONTRACT # **COST**

ORGANIZATION Ontario Centre for Remote Sensing,
Surveys and Mapping Branch,
Ministry of Natural Resources,
880 Bay Street, 3rd Floor,
Toronto, Ontario.
M5S 1Z8

PRINCIPAL INVESTIGATOR Dr. S. Pala and A. Boissoneau.

DURATION 1977 - ongoing.

SPONSOR Lands Use Coordination Branch (MNR) and OCRS.

SCIENTIFIC AUTHORITY Dr. Simsek Pala and Art Boissoneau,
Ontario Centre for Remote Sensing,
Ministry of Natural Resources,
880 Bay Street, 3rd Floor,
Toronto, Ontario.
M5S 1Z8

OBJECTIVE

To produce maps containing detailed information of wetlands and the entire Hudson Bay/James Bay Lowlands.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Over 500 sites in the lowlands have been investigated during the three summer periods of 1977, 1978 and 1979. Maps are being prepared based on digital analysis of satellite data and printed with an Applicon computerized printing system.

STATUS AND COMMENTS

Four 1:250,000 scale mapsheets have been completed, not yet published. These mapsheets cover:

Kenogami River
Ogoki
Ghost River
Smoky Falls

The intention is to publish these maps in 1982.

REPORTS

Boissonneau, A. and J.K. Jeglum, 1975. A Regional Level of Wetland Mapping for the Northern Clay Section of Ontario. *Proceedings*, Third Canadian Symposium on Remote Sensing, Edmonton, Alberta, p. 349-358.

Boissonneau, A. and S. Pala, 1978. An Ecological Classification Project for the Ontario Portion of the Hudson Bay/James Bay Region. *Proceedings*, Second Meeting, Canada Committee on Ecological (Biophysical) Land Classification, Victoria, B.C., p. 65-72.

Boissonneau, A. 1981. Canadian Initiative in Wetland Inventory. *Proceedings* Ontario Wetlands Conference, The Federation of Ontario Naturalists, Toronto, Ont., in press.

Pala, S. and A. Boissonneau, 1979. Biophysical Classification of the Hudson Bay/James Bay Lowland. *Proceedings*, Remote Sensing Symposium of the Canada-Ontario Joint Forest Research Committee, Toronto, Ontario. p. 68-76.

Pala, S. and W. Weischet, 1981. Toward a Physiographic Analysis of the Hudson Bay/James Bay Lowland. *Proceedings* Symposium on Scientific Studies on Hudson/James Bay. *Le Naturaliste Canadien* (in press).

Pala, S. and A. Boissonneau, 1981. Wetland Classification Maps for the Hudson Bay Lowland. *Proceedings*, Symposium on Scientific Studies on Hudson/James Bay. *Le Naturaliste Canadien* (in press).

TITLE Wetland Inventory - N.E. Ontario Region.

CONTRACT # In-house **COST**

ORGANIZATION Forest Resources Group, North Eastern Region,
Ontario Ministry of Natural Resources,
Ontario Government Bldg.,
199 Larch Street,
Sudbury, Ontario.
P3E 5P9

PRINCIPAL INVESTIGATOR Maureen Kershaw; (705) 675-4144.

DURATION 1 April 1981 to 31 Dec. 1981.

SPONSOR Ontario Ministry of Natural Resources.

SCIENTIFIC AUTHORITY Cam Stevens, (administrator),
Forest Resources Group, North East Region,
Ontario Ministry of Natural Resources,
Ontario Government Bldg.,
199 Larch Street,
Sudbury, Ontario.
P3E 5P9 (705) 675-4144.

OBJECTIVE

To inventory the peatland resources of the North Eastern Ontario Region from the point of view of peat deposit quantity and type plus geomorphology and surface vegetation.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Two crews of two individuals each are giving a Jeglum, Boissoneau, Haavisto plant communities ecological classification to each peat land surveyed. Notes of Radforth evaluation are also made. Area surveyed extends from approximately Marathon in the west to New Liskeard in the east and North Bay and south as far as the French River. Holes are also being bored as part of traverse studies at each bog with notes made of each type of peat found at each level in the bog.

STATUS AND COMMENTS

Work is being taken over by the Ontario Geological Survey Program (see Ontario Peat Resource Program).

REPORTS

TITLE Newfoundland Peatland Inventory Update and Completion of South Central Newfoundland.

CONTRACT # **COST**

ORGANIZATION Northland Associates Limited,
P.O. Box 1734,
13 Prescott Street,
St. John's, Newfoundland.
A1C 5P5

PRINCIPAL INVESTIGATOR J.P. Bouzane and Ed Dawe.

DURATION 2 months.

SPONSOR Government of Newfoundland and Labrador.

SCIENTIFIC AUTHORITY Doug Vanderveer,
Department of Mines and Energy,
P.O. Box 4750,
St. John's, Newfoundland.
A1C 5T7

OBJECTIVE

1) to update 1978 and 1979 data on a format comparable to 1980 - 83 data;

2) to complete the peatland inventory of south-central Newfoundland;

3) to put all data for 1978 - 83 in a computer compatible format.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

This inventory covers only the island portion of the province, no inventory of Labrador is being done at present. The biophysical approach was used for mapping and field-sampling. Ecodistrict maps are prepared for the entire study area. These districts served as the primary stratification of the land surface, and field sampling intensity was dictated by the area of peatland within each district. Results obtained from the sampling within a district are then extrapolated to the whole district.

The inventory is compiled from aerial photographs with representative ground truthing. Peatlands are typed according to the national wetland system modified for local conditions.

The work was divided into six phases and is now complete.

STATUS AND COMMENTS

Six reports covering the five years of work (1978 - 1983) are available on microfiche. A complete set of drafted maps in a 1:12,500 scale format (for years 1978 - 1982) and on a 1:50,000 scale format (for 1983) have been prepared that show the distribution and types of peat deposits.

The first five reports, accompany volume tables (showing the location, area, classification, and volume of peat for each deposit mapped) and the majority of the maps have been microfiched in preparation for an open file release. Copies can be obtained from the Newfoundland Department of Mines and Energy, P.O. Box 4750, St. John's.

REPORTS

1. Peatland Inventory - North Central Newfoundland 1978, Northland Associates Ltd., St. John's, Newfoundland 1979.
2. Peatland Inventory - Western Newfoundland 1979, Northland Associates Ltd., St. John's, Newfoundland 1980.
3. Peatland Inventory - Eastern Newfoundland 1980, Northland Associates Ltd., St. John's, Newfoundland 1981.
4. Peatland Inventory - Northern Newfoundland 1981, Northland Associates Ltd., St. John's, Newfoundland 1981.
5. Peatland Inventory - South Central Newfoundland 1982, Northland Associates ltd., St. John's, Newfoundland 1982.
6. Updating of the Existing Peatland Inventory Data and Completion of the Inventory in South - Central Newfoundland, 1983, Northland Assoc. Ltd., St. John's, Newfoundland 1984.

TITLE Etude des tourbières du Lac Saint-Jean.
(Study of Lac St-Jean area peatlands)

CONTRACT # **COST** $275,000.

ORGANIZATION Le Groupe Dryade (Sylveco),
642 boul. St-Cyrille ouest,
Québec, Québec.
G1S 1S8

PRINCIPAL INVESTIGATOR Rodrigue Coulombe; (418) 681-0687
Jacques Ouzilleau

DURATION 1979-1981.

SPONSOR Hydro-Québec

SCIENTIFIC AUTHORITY Gérard Slupik,
Hydro-Québec,
Direction ingénierie de centrales,
855 est, rue Ste-Catherine,
14e étage, Place Dupuis,
Montréal, Québec.
H2L 4P5 (514) 289-5464.

OBJECTIVE

Study of bogs in the Lac St-Jean area of Québec to establish the potential for their use as fuel peat. Study entailed a detailed survey of 16,490 ha. of peatlands in the Lac St-Jean area. The survey included a precise inventory of the volume and associated weights of principle peatlands in the Lac St-Jean area to be used for energy production. The topography and vegetation is also given.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

1. A cartographic inventory and the synthesis of existing knowns for the Lac St-Jean region.
2. A selection of principle peatlands deemed most likely for peat exploitation and containing a minimum surface area of 100 ha.
3. These peatlands are then bored to determine:
   - a) precise estimation of volume by sampling a 200 m. grid pattern.
   - b) a series of peat profiles which would represent forms, depths as well as position of H4 horizon on the Von Post scale. (see #)
   - c) the classification of peat with respect to trophism of the morphology and the vegetation.
   - d) the representation of hydrographic network as well as consideration about the drainage capacity.
   - e) an analysis of the ash content in the peat sites studied.
   - f) all factors possible affecting the peat quality.
   - g) all factors affecting production.

Surveys had previously been conducted in the Lac St-Jean area by the Québec government to assess horticultural peat. A preliminary survey was also conducted by Cartier Enbineering (Monenco) Ltd. in 1978 as part of a feasibility study for a 250 MW thermal power plant for the area. Hydro-Québec conducted its own survey in 1980-81 to assess the real potential of this resource for future use.

actual surface area bored is 22,500 ha. where 16,500 ha. of the peat had a thickness greater than 50 cm.

LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL

STATUS AND COMMENTS

The volume inventory involves 36 peatlands. All these peatlands are situated north of Lac St-Jean. The total surface area inventoried is 16 490 ha. The total volume of peat is 245.5 million m3. The water content included in this figure is 180.2 million m3. The average depth is 1.5 m.

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REPORTS

Le groupe Sylveco, 1980, Etude des tourbières du Lac St-Jean 61 pp. plus cartographic annex.

-------, 1981, Etude des tourbières du Lac St-Jean. 95pp. plus cartographic annex.

1981 Volume 1: report Volume 4: maps
Volume 2: appendix Volume 5: maps
Volume 3: maps

TITLE Inventaire des tourbières du Québec meridional.
(Southern Québec Peatland Inventory).

CONTRACT # 08710-RA-83/11 **COST** $200,000.

ORGANIZATION

PRINCIPAL INVESTIGATOR

DURATION 1980-1981 (12 months); final publication in 1983.

SPONSOR Hydro-Québec.

SCIENTIFIC AUTHORITY Gérard Slupik,
Génie civil,
Structures et Mécanique,
Hydro-Québec.
855 est, rue Ste-Catherine,
14e étage, Place Dupuis,
Montréal, Québec.
H2L 4P5 (514) 289-5464

OBJECTIVE

The 1980 cartographic inventory of peatlands of 100 ha. or more of that part of Québec found south of the 50th parallel (51st parallel for the North Coast) had the main objectives of: localisation and determination of extent of surface area of fuel-peat resources.

It showed a surface area totalling 846,902 ha. in 2,117 peat bogs of varying dimensions. This inventory confirms the presence, in the area studied, of several sectors having a high concentration of peat deposits. It should be noted that the sectors with most interesting aspects regarding surface area and content are found in the northern part of the territory.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

The inventory of Southern Québec peatlands is based on a systematic cartographic research of apparent surface deposits. This research is carried out from maps to the scale of 1:20,000 from the Department of Forest Inventory of the Ministry of Energy and Resources Québec. These maps contain forestry information resulting from photo-interpretation of the whole of the southern part of the province.

STATUS AND COMMENTS

REPORTS

1) 1 report.
2) 1 directory of 1:250,000 maps covering the province.
3) 14 notebooks of forestry maps of 1:20,000
4) 21 notebooks of identified peatlands forms

TITLE Inventaire et cartographie de tourbières par télédétection, Abitibi, Québec.
(Inventory and Mapping of peatland by teledetection, Abitibi, Québec).

CONTRACT # **COST** $16,500

ORGANIZATION Le Groupe Dryade,
642 boul. St-Cyrille ouest,
Québec, Québec
GiS 1S8

PRINCIPAL INVESTIGATOR Amtonin Guimond, Pierre Grondin and René Dubuc; (418) 681-0687.

DURATION July 1984 to March 1985.

SPONSOR Ministry of Energy and Resource, Québec.

SCIENTIFIC AUTHORITY Hervé Audet,
Ministère de l'Energie
et des Ressources
Québec,
1919 Charest ouest,
Ste-Foy, Québec.
G1N 4H9
(418) 643-6871.

et

Pierre Buteau,
1620 blvd. de
l'Entente,
Québec, Québec
G1S 4U6
(418) 643-1803

OBJECTIVE

To develop and apply a method of processing satellite imagery based on digital enhancement.

To carry out photo-interpretation of these to map the physionomic types of peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Various methods of image enhancement will be adopted and applied to the processing of digital images sent by LANDSAT satellite and SPOT simulation, which cover a part of Abitibi area of Québec. Control points will be established in order to readjust the processing before proceeding with final photo-interpretation and the resulting map. This processing will aim at accentuating as much as possible the quality of the imagery for the desired purpose, being the distinction of physionomic units of peat.

STATUS AND COMMENTS

In progress.

REPORTS

Due March 1985.

TITLE New Liskeard Peatland Inventory.

CONTRACT # 83-111 **COST** $126,526.

ORGANIZATION Hunter and Associates,
Suite 201,
6870 Goreway Drive,
Mississaugam Ontario.
L4V 1P1

PRINCIPAL INVESTIGATOR Mr. David W. Smith.

DURATION August 1983 to May 1984.

SPONSOR Ontario Geological Survey, Ministry of Natural Resources

SCIENTIFIC AUTHORITY Mr. J. Riley,
Engineering and Terrain Geology Section,
Ontario Geological Survey,
Room 725, 77 Grenville Street,
Toronto, Ontario.
M5S 1B3 (416) 965-1183.

OBJECTIVE

To conduct detailed and reconnaissance level evaluation for designated peatland sites in the New Liskeard area, Northern Ontario.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	MNR	Hunter & Assoc.	$126,526.

DESCRIPTION

1) Subdivide and mapping of all designated peatlands on the basis of airphoto interpretation and field work into major types (bogs, fen, swamp, marsh and open water).

2) Field vegetation sampling elevation survey and field peat sampling to evaluate peat type and humification stratigraphy, peat volumes, elevation, drainage and surficial vegetation.

3) Assessment of each peatlands potential for fuel peat and/or horticultural peat mining.

STATUS AND COMMENTS

Completed Spring 1984.

REPORTS

Hunter and Associates 1984:
"Peat and peatlands evaluation of the New Liskeard area", (parts of NTS 1:250,000 Series Map Sheets 31M and 41P). Ontario Geological Survey, Open File Report 5489.

TITLE Application of Landsat Digital Image Analysis to Peatland Inventory.

CONTRACT # **COST**

ORGANIZATION Department of Soil Science,
University of Alberta,
Edmonton, Alberta.
T6G 2E3

PRINCIPAL INVESTIGATOR C.L. Palylyk; P.H. Crown.

DURATION 1983-84

SPONSOR Resource Evaluation and Planning Division,
Alberta Energy and Natural Resources.

SCIENTIFIC AUTHORITY L.W. Turchenek and R.J. Fessenden,
Terrain Sciences Department,
Alberta Research Council,
Terrace Plaza - 6th Floor,
4445 - Calgary Trail South,
Edmonton, Alberta.
T6H 5R7

OBJECTIVE

To investigate the application of LANDSAT MSS digital data to a peatland inventory in the lower Boreal Forest Region of Alberta.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

System corrected computer compatible tapes of May and September imagery were obtained for two, 625 km2 study areas located in the Athabasca-Calling Lake region of central Alberta. Three methods of digital image analysis were employed sequentially, each providing more detailed information. Visual analysis of enhanced multidate colour-composite images provided a first approximation of the location and areal extent of indigenous peatland types. Unsupervised classification identified potential variations in type and density of groundcover and guided field investigations. Field investigations allowed for selection of training and verification areas for supervised classification. Identification and quantification of specific vegetation complexes associated with peatlands was best accomplished through supervised classification. Computer generated thematic maps and hardcopy colour-composite images were generated. Multiple classification and themes representing heterogeneous groundcover have been the main drawbacks to date in adopting this methodology for routine inventory procedures.

STATUS AND COMMENTS

The project will continue until early 1985 with emphasis on developing supervised classification procedures.

REPORTS

C.L. Palylyk, P.H. Crown and L.W. Turchenek, 1984. Landsat MSS Digital Data and a Peatland Inventory for Alberta. Canadian Society of Soil Science Annual Meeting, Banff, Alberta.

TITLE Canada-Manitoba Soil Survey - Organic Soils

CONTRACT # **COST** $7,000.

ORGANIZATION
Dept. of Soil Science,
362 Ellis Bldg.,
University of Manitoba,
R3T 2N2.

PRINCIPAL INVESTIGATOR Mr. Gordon F. Mills
(204) 474-8153 Ext. 175

DURATION On-going since 1981

SPONSOR Shared federal-provincial agricultural departments approx. 50/50

SCIENTIFIC AUTHORITY
Mr. R.E. Smith, Director,
Canada-Manitoba Soil Survey,
362 Ellis Building,
University of Manitoba,
Winnipeg, Manitoba.
R3T 2N2. (204) 474-8153 Ext. 130.

OBJECTIVE

As part of the on-going soil survey of the Thompson clay belt in central Manitoba, the objective of this project, is to characterize gently sloping organic terrain with "Bog Veneer" landforms and submit detailed descriptions for inclusion in the Canadian Wetland Registry. The following subobjectives have been identified: a) to monitor soil thermal and moisture relations in a toposequence of soils ranging from well drained Luvisols to poorly drained Organic Cryosols;
b) to assess the effects of removal of vegetative cover and peaty surface layers on soil climate;
c) to assess the drainability of various soils in the toposequence in terms of potential agricultural development.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
	Agric. Canada	Manitoba Agric.	
1984-85	$3,500.	$3,500.	$7,000.

DESCRIPTION

This two phase study initiated in 1981 consists of detailed characterization of two sites in terms of soil, vegetation, topography, drainage and permafrost properties. Phase 1 includes detailed instrumentation to determine various aspects of soil thermal and moisture regimes within the two study sites.

Phase 2 consists of a monitoring program for a minimum of 5 years to study soil climate conditions as related to permafrost-groundwater-vegetation conditions particularly as they relate to soil morphology and soil drainage classification.

STATUS AND COMMENTS

Phase 1 is nearing completion. Characterization of the first study site in mature coniferous forest typical of the central Boreal is complete. A second study site has been established in a fifteen year old burned area but characterization is incomplete. Instrumentation of both sites has been initiated and monitoring is ongoing.

If support for this project can be maintained or increased, there is need to establish a similar study site in the central portion of the clay belt south of Wabowden. This additional site will assist in the determination of potential of these lands for northern agriculture.

REPORTS

No summary or reports to date.

TITLE A Woodlot Evaluation System for Southern Ontario.

CONTRACT # 525-08736-8107 **COST** $29,080.

ORGANIZATION Ecologistics Limited,
Westmount Place,
50 Westmount Road N.,
Suite 225,
Waterloo, Ontario.
N2L 2R5

PRINCIPAL INVESTIGATOR Dr. D.J. Coleman,
Ecologistics Limited.

DURATION 15 October 1981 to 31 May 1982.

SPONSOR Ontario Hydro.

SCIENTIFIC AUTHORITY S.W. Hounsell,
Ontario Hydro,
700 University Avenue,
Toronto, Ontario.

OBJECTIVE

The purpose of this study is to prepare a system that is capable of evaluating the functions and values of Southern Ontario woodlots. The evaluation system will assist Ontario Hydro planners in deciding on the optimum delineation of power line right-of-ways and, hopefully, will become a planning tool throughout Ontario.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

The alternative methods for evaluating woodlots will be judged by their capability to satisfy the following criteria:

1) be of maximum value for Hydro's environmental planners during the evaluation and comparison of woodlots for transmission route planning studies;
2) be holistic, considering the biological, hydrological and cultural values of woodlots;
3) be capable of comparing one woodlot to another based upon an explicitly defined and consistently applied rating scale, thus enabling the ranking of woodlots according to their level of importance for protection/preservation;
4) be replicable. The evaluation should yield similar results, at least in terms of the relative ranking of woodlots, by different trained users at the B.Sc. level;
5) be scientifically acceptable and as objective and quantitative as possible;
6) make maximum use of existing information while minimizing the necessity of detailed field studies for the evaluation application;
7) be scale independent. The method should be flexible so as to incorporate information on various scales of study to fit within the context of Hydro's iterative planning process;
8) the information generated by the system should be compatible for storage and analysis by the Land Use and Environmental Planning Department's computer facilities;
9) be open-ended in such a way that future studies and information may be incorporated into the evaluation system without altering the general system or the evaluation criteria or weighting ratio between those criteria;
10) be cost and time efficient as possible while fulfilling the preceeding criteria.

STATUS AND COMMENTS

Three workable woodlot evaluation systems were designed which varied primarily in the amount of field work required to complete the evaluative process. Wetland forests were included in the evaluation and organic soils are utilized as indicators of hydrological function. The evaluation systems are scheduled for field testing in the summer of 1982.

4.6.1 PEAT RESOURCE INVENTORY

JAC 28/8/84

TITLE Wetland Mapping Series for Southern Ontario.

CONTRACT # **COST**

ORGANIZATION Individual: Elizabeth Snell,
R.R. 1,
Cambridge, Ontario.
N1R 5S2

PRINCIPAL INVESTIGATOR Elizabeth Snell; (519) 623-0755.

DURATION February 1981 to August 1981;
- revised May to September 1982;
- updated 1984.

SPONSOR

SCIENTIFIC AUTHORITY Elizabeth Snell and
Garth Bangay, Regional Director,
Lands Directorate - Ontario Region,
Environment Canada,
P.O. Box 5050,
867 Lakeshore Road,
Burlington, Ontario.
L7R 4A6 (416) 637-4551.

OBJECTIVE

Using existing information, compile a map set at 1:50,000 of the wetlands of southern Ontario; south of the Precambrian shield.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Overlaid existing maps of wet soils with existing maps of natural land land use (as opposed to cropland or urban land etc.). Where these conditions coincided, assumed it represented a wetland. Presented on 1:50,000 National Topographic Series map sheets.

- Also estimated losses of wetlands, by the difference of total wet soil area and wetlands as mapped above.
- For above, most recent available land use data was 1967.
- In 1983/84, Land Use maps for 1982 were published. This data base overlaid on wet soils allowed update of wetland maps, showing both losses over 2 centuries, and losses 1967 to 1982 as well as the remaining wetlands as of 1983.

STATUS AND COMMENTS

Revised summer 1982.
124 map sheets of Wetland Mapping Series: Second Approximation, completed.
Update with the 1982 Land Use is to be completed in 1984.

REPORTS

An Approach to Mapping the Wetlands of Southern Ontario
E. Snell in Wetlands Research in Ontario, Proceedings of Pre-Conference Session of the Ontario Wetlands Conference. September 1981.

TITLE Saskatchewan Federal-Provincial Peat Program

CONTRACT # Canada-Saskatchewan Interim Subsidiary Agreement on Mineral Exploration, 1978 **COST** $200,000

ORGANIZATION Saskatchewan Dept. of Mineral Resources,
1914 Hamilton Street,
Regina, Saskatchewan, S4P 4V4.

PRINCIPAL INVESTIGATOR Bob Troyer

DURATION Peat-related investigations terminated in 1983.

SPONSOR DREE, EMR and Provincial government.

SCIENTIFIC AUTHORITY Paul Guliov, Head,
Industrial Minerals Division,
Saskatchewan Dept. of Mineral Resources,
1914 Hamilton Street,
Regina, Saskatchewan.
S4P 4V4 (306) 565-2583.

OBJECTIVE

To document and assess the potential of Peat Resource in the peatland belt of west central Saskatchewan.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
	DREE	Province	
1977-78	$25,000	$25,000	$50,000
1978-80	$10,000	$75,000	$85,000
	EMR		
1980-81	$10,000	$20,000	$30,000
1981-82	-	$35,000	$35,000

DESCRIPTION

1) In 1977, Montreal Engineering was hired for $50,000 to conduct a study of the feasibility of peat utilization for northern communities.

2) The Saskatchewan Dept. of Minerals conducted a field project to assess the extent of the resource in their Buffalo Narrows/Beauval and Pinehouse/La Ronge areas at an estimated cost of $75,000 each. About 300 bogs were found with 3 H factors, good drying conditions and the areas below the permafrost zone.

3) Montreal Engineering was hired to conduct a Buffalo Narrows Peat Utilization Study - report has been available since spring 1981.

4) Department of Mineral Resources, Policy Planning and Research Group has conducted a study on the cost of energy services in the rural milieu in which the peat was looked at. Contact Kim Graybiel for information.

5) A project of one month duration involving Montreal Engineering was undertaken 1 Aug. 1981 to 1 June, 1982. Airphoto interpretation of fuel peat bogs around La Ronge was the objective of the study. A ground-truthing field study to check out potential fuel peat bogs delineated on the airphotos was undertaken commencing 9 Aug. 1982 by Bob Troyer.

STATUS AND COMMENTS

A report is in the final stages covering the field work in the areas of Buffalo Narrows/Beauval and La Ronge/Pinehouse. (Bob Troyer is no longer involved in peat work.)

REPORTS

Assessment of Technical and Economic Feasibility of Peat Resource Development in Northern Saskatchewan Communities, Montreal Engineering Ltd., 1978, Unpublished, 200 pp.

Buffalo Narrows Peat Utilization Study, Montreal Engineering Ltd., Spring 1981, 200 pp., Saskatchewan Publications Office, Open File OF81-2.

A general inventory for peatlands in Saskatchewan is available from field notes only from Saskatchewan Dept. of Mineral Resources. However, these may be photocopied.

Potential Peat Areas of Saskatchewan, south of the Precambrian shield, Map by R. Troyer, 1978.

TITLE Organic Soils Mapping and Interpretation Workshop, Fredericton, N. B.

CONTRACT # **COST**

ORGANIZATION Soil Survey Unit, L.R.R.I.,
Agriculture Canada,
P.O. Box 20280,
Fredericton, N. B.
E3B 4Z7

PRINCIPAL INVESTIGATOR Herbert W. Rees; (506) 452-3260.

DURATION 15-18 September 1981.

SPONSOR Agriculture Canada, Land Resource Research Institute.

SCIENTIFIC AUTHORITY Dr. J.S. Clark,
Land Resource Research Institute,
K.W. Neatby Building,
Agriculture Canada,
920 Carling Avenue,
Ottawa, Ontario.
K1A 0C6 (613) 995-5011.

OBJECTIVE

To co-ordinate methods of organic soils mapping and inventory.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

The general theme for the workshop was on peatland characterization, mapping and interpretation methodologies. Sessions included:

a) Examples of organic soil mapping in B. C., Alberta, New Brunswick, Newfoundland.

b) Characterization and classification of peats.

c) Organic soil interpretation and utilization.

d) Photo interpretation and legend building exercises.

e) Field trips.

STATUS AND COMMENTS

Proceedings published late summer 1982.

REPORTS

TITLE Peatlands Inventory Pilot Project

CONTRACT # **COST**

ORGANIZATION Terrain Sciences Department,
Alberta Research Council,
6th Floor, Terrace Plaza,
4445 - Calgary Trail South,
Edmonton, Alberta.
T6H 5R7

PRINCIPAL INVESTIGATOR L.W. Turchenek; D.E.B. Storr.

DURATION April 1983 - March 1984.

SPONSOR Resource Evaluation and Planning Division,
Alberta Energy and Natural Resources.

SCIENTIFIC AUTHORITY Dr. R.J. Fessenden,
Terrain Sciences Dept.,
Alberta Research Council,
6th Floor, Terrace Plaza,
4445 Calgary Trail South,
Edmonton, Alberta.
T6H 5R7

OBJECTIVE

To develop and field test a peat and peatland inventory system for Alberta. Three subprojects had as their objectives the evaluation of conventional airphoto interpretation and field checking methodology for reconnaissance survey, the development and evaluation of LANDSAT digital image analysis for classification and mapping of peatlands at a reconnaissance level, and demonstration of high intensity (1:10,000) inventory methodology in a small peatland area.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	50%	50%	

DESCRIPTION

A litterature review of approaches and methodologies in peatland inventory carried out in other provinces and countries was initially conducted. A review of peatland information already available for the province of Alberta in the form of various land resource surveys indicated that for most of the province there was insufficient information available for land use planning purposes.

The pilot reconnaissance inventory was carried out in two 625 km2 areas in central Alberta. Airphotos of 1:60,000 and 1:30,000 scales were used. Field methodology was based mainly on investigations of peatland sites along transects as developed by Tarnocai (Land Resource Research Institute, Ottawa) and others. Mapping units were based on the Canadian Wetland Classification System. Peatland maps were produced at scales of 1:50,000 and 1:100,000. The detailed inventory project was conducted by examining sites on a 200 m grid within a 1 km2 study area. Complete descriptions of peat profiles, surface peatland features and vegetation were made at each site. Analyses of data was assisted by use of a computer data base management system.

The investigation of LANDSAT methodology was carried out at the University of Alberta and is described elsewhere in this publication.

STATUS AND COMMENTS

Field work was carried out during 1983. A draft final report was submitted to the sponsor in spring, 1984 , and is currently under review. Research on various aspects of peat and peatland classification and mapping is continuing during 1984 as part of another project.

REPORTS

Turchenek, L.W., Storr, D.E.B., Palylyk, C.L., and Crown, P.H. 1984. Peatlands inventory pilot project. Draft Final Report for Resource Evaluation Branch, Resource Evaluation and Planning Division, Alberta Energy and Natural Resources.

TITLE Characterization of Organic Soils in Relation to Inventory and Land Use.

CONTRACT # **COST**

ORGANIZATION Terrain Sciences Department,
Alberta Research Council,
6th Floor, Terrace Plaza,
4445 - Calgary Trail South,
Edmonton, Alberta.
T6H 5R7

PRINCIPAL INVESTIGATOR L.W. Turchenek, D.E.B. Storr.

DURATION On-going since 1982.

SPONSOR Alberta Research Council.

SCIENTIFIC AUTHORITY Dr. R.J. Fessenden,
Terrain Sciences Department,
Alberta Research Council,
6th Floor, Terrace Plaza,
4445 Calgary Trail South,
Edmonton, Alberta.
T6H 5R7

OBJECTIVE

To develop methods of investigating and of establishing criteria for Organic soil mapping units in Alberta; to study chemical and physical properties of various Organic soil types; and to investigate temperature regimes of Organic soils.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

At numerous sites in central and northeastern Alberta, Organic soil profiles were examined and samples were collected for laboratory analyses. Both field and laboratory data were statistically analysed to determine which soil properties would be of greatest importance in terms of establishing mapping units and ultimately in terms of making land use interpretations. Six soil temperature monitoring sites were established in west-central Alberta in order to assess thermal characteristics of Organic soils in relation to agriculture, forestry, and engineering applications.

STATUS AND COMMENTS

During 1984-85, this project was interrupted by the Peatlands Inventory Pilot Project (also summarized in this publication). A preliminary report will be prepared during early 1985.

REPORTS

TITLE Storage of Non-living Organic Carbon in Boreal and Arctic Zones.

CONTRACT # **COST** $295,000. and $5,000.

ORGANIZATION Institute for Environmental Studies,
University of Toronto,
Toronto, Ontario
M5S 1H8

PRINCIPAL INVESTIGATOR Dr. B.W. Boville and
Dr. R.E. Munn; (416) 978-7076.

DURATION Dec. 1981 to 1984-85.

SPONSOR U.S Department of Energy and
Atmospheric Environment and Service, Canada.

SCIENTIFIC AUTHORITY Roger C. Dahlman,
Carbon Dioxide Research Division,
Office of Energy Research,
Department of Energy,
Washington, D.C.,
U.S.A. 20545

OBJECTIVE

To synthesize data and information on the storage and rates of change of non-living organic carbon (bogs, soils, lakes) in land areas of northern latitudes (Canada, Alaska, Scandinavia, etc.). The primary products will be sets of charts and tables providing the best available data on the areal extent, depth, carbon content, history and rates of change of the stored non-living organic carbon at northern latitudes. These products will provide a detailed representation and documentation on this component as required for modelling the global carbon cycle.

FUNDING

Fiscal Year	Sponsor	Environment Canada	Total
1981	$46,000.	$5,000.	$51,000.
1982-85			

DESCRIPTION

The project has started from the cover-type data for Canada detailed in a contract submission by Hare *et al*. These data are being refined by the use of recent wetlands studies, and will be co-ordinated with others, such as Olson's global grid estimates. Carbon inventories and data are being obtained from the Peat Forum, Project ENFOR, Hudson Bay Lowlands studies, and details from each Canadian province. Information gaps will be filled and histories formulated from studies of soil cores and radio-carbon dating. Eventually as further funding permits, these will be confirmed by co-operative field studies and extrapolated with available data to other northern lands.

Data and information on estimates of the non-living stored carbon and rates of change with error bounds, will be provided progressively:
1) Documentation on the distribution of stored carbon over Canada and estimates of rates of change to be provided by Sept. 1982.
2) Detailed documentation by grid area or region on types of carbon deposits, density/depth profiles and historical and future rates of change with extrapolations to other countries by end of second contract period.
3) Further refinements of (2) and particularly the data for other countries together with improvements on simple submodel, for this component of the global carbon cycle.

STATUS AND COMMENTS

Final report submitted and projects terminated as funds no longer available.

REPORTS

TITLE Use of Impulse Radar Techniques for Depth Profiling of Newfoundland Peat Deposits.

CONTRACT # **COST** $73,228.48

ORGANIZATION Remotec Applications Ltd.,
A.D.G. Building,
47 Clyde Ave.,
Donovans' Park,
St. John's, Newfoundland.

PRINCIPAL INVESTIGATOR Tim Perrot; (709) 364-1779/2032/2033.

DURATION June 1981 to March 1982.

SPONSOR National Research Council of Canada.

SCIENTIFIC AUTHORITY Dr. Fred R. Hunt,
Division of Electrical Engineering,
National Research Council,
Montreal Road, M-50, Rm. 373,
Ottawa, Ontario.
K1A 0R6 (613) 993-9214.

OBJECTIVE

To demonstrate the potential of impulse radar techniques for a fast, wide area inventoring of peatland resource characteristics. Peat is usually classified according to the botanical composition and degree of humification: thus different layers may exhibit different properties. Radar pulses are directed to the ground. The pulses reflect back to the surface from the various subsurface interfaces such as the peat/soil interface at the bottom of the peat deposit.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82	$73.228.48		$73,228.48

DESCRIPTION

The proposed program of research outlines a surfaced-based program as well as an air-borne program. By using a grid system, the radar will be used to determine the area and volume extent of the peat deposit. A grid system of parallel and orthogonal lines should enable the measurement of the areal extent and the depth of the deposit. Three peat deposits are being sampled - once in early summer when conditions are relatively wet, then in fall when conditions are drier. A metallic reference-"Molybolt" or metal sheet will be placed at a known depth to calibrate the equipment. For the surface program, the radar is being pulled over the bog by an all-terrain vehicle. Verification will be made by manual depth sampling, previous data, radar calibrations and possibly some dielectric measurements if equipment is available. Air measurements are to be made from a Bell Jet Ranger helicopter. Various heights, starting at 5 metres above ground will be used to establish most favourable altitude. The grid pattern will be used for the flights. Two different wavelengths of radar are being used.

STATUS AND COMMENTS

4 June 1982. Measurements made last year indicated that a ground-based impulse radar system can successfully profile peat deposits to depths in excess of 7.5 meters. Airborne results have been inconclusive as only weak returns are received from the bottoms of the deposits.

Other researchers have found that better results are obtained when the peat is frozen. Therefore, the program was expanded to allow measurements in the winter of 81-82. Receipt of the final report was in summer.

REPORTS

The Use of Impulse Radar Techniques for Depth Profiling of Peat Deposits. Available from Peat Program Manager; T.E. Tibbetts, NRC Atlantic Research Labs., 1411 Oxford St., Halifax, Nova Scotia B3H 3Z1.

TITLE A Review of Canadian Peatland Inventory Data (Between 1960 and 1981).

CONTRACT # OSZ82-00032 **COST** $20,000.

ORGANIZATION Dendron Resource Surveys Ltd.,
800 Lady Ellen Place, Suite 206,
Ottawa, Ontario.
K1Z 5L9

PRINCIPAL INVESTIGATOR Erwin Goertz; (613) 725-2971.

DURATION Summer 1982.

SPONSOR Peat Forum.

SCIENTIFIC AUTHORITY Charles Tarnocai,
Land Resource Research Institute,
Agriculture Canada,
K. W. Neatby Building,
920 Carling Avenue,
Ottawa, Ontario.
K1A 0C6.

OBJECTIVE

1) To provide, based on available inventories, the area of peatland surveyed in Canada and to indicate the level of information these surveys contain.

2) To produce a national peatland distribution map.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	$20,000.		$20,000.

DESCRIPTION

This contract was to provide a review of peatland inventories carried out in Canada and the level and type of information these inventories contain. In addition to this, it was to summarize the extent of Canada's peat resources based on the last 21 years of information contained in these inventories. The Contractor was to visit the peatland inventory groups in most provinces to seek out regional information relating to the methodology used in peatland surveys and the direction taken in each inventory program. The resource contacts were provided to the Contractor.

A report on Canadian peatland inventories with summary and critique of the individual projects - including an outline of the methodology used - was produced. Also produced was a peatland map based on these inventories - indicating the area of peatland resource surveyed as well as a provisional peatland distribution map based on four classes of peatland as percentages of total land area.

STATUS AND COMMENTS

Project completed August 1982.

REPORTS

TITLE Newfoundland Peat Inventory.

CONTRACT # **COST** $120,000. a year

ORGANIZATION Northland Associates Ltd.,
13 Prescott St., P.O. Box 1734,
St. John's, Newfoundland.

PRINCIPAL INVESTIGATOR Ed Dawe; (709) 754-2052.

DURATION 1978-1983?

SPONSOR DREE and Nfld. Forest Resources and Lands.

SCIENTIFIC AUTHORITY Bob Mercer,
Director of Forest Management,
Dept. of Forest Resources and Lands,
Bldg. 810. Pleasantville,
St. John's, Newfoundland.
A1A 1P9 (709) 737-3750.

OBJECTIVE

To determine the extent (location, area, and volume) and to classify the peatland resources of Newfoundland. No detailed information is available for any one location. Potential developers are responsible for more detailed surveys. 90% of the total land mass is crown-owned. Only about 7% of land ownership has been granted ownership of underlying mineral rights.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
	50%	50%	

DESCRIPTION

This inventory covers only the island portion of the province, no inventory of Labrador is being done at present. The biophysical approach was used for mapping and field-sampling. Ecodistrict maps are prepared for the entire study area. These districts served as the primary stratification of the land surface, and field sampling intensity was dictated by the area of peatland within each district. Results obtained from the sampling within a district are then extrapolated to the whole district.

The inventory is compiled from aerial photographs with representative ground truthing. Peatlands are typed according to the national wetland system modified for local conditions.

The work has been divided into six phases of which four are now complete and the fifth phase is in progress.

STATUS AND COMMENTS

The first four reports are now available on a restricted basis. A complete set of drafted maps - in a 1:12,500 scale format, showing distribution and types of peat deposits - have been prepared. Each report has an accompanying volume of peat for each deposit mapped. Reports can be obtained from the Newfoundland Department of Forest Resources and Lands, Forestry Branch.

REPORTS

Peatland Inventory - North Central Newfoundland 1978 Northland Associates Ltd., St. John's, Newfoundland, 1979 $20.00.

Peatland Inventory - Western Newfoundland 1979, Northland Associates Ltd., St. John's, Newfoundland, 1982, $20.00.

Peatland Inventory - Eastern Newfoundland 1980, Northland Associates Ltd., St. John's, Newfoundland, 1981, $20.00.

Peatland Inventory - Northern Newfoundland 1981, Northland Associates Ltd., St. John's, Newfoundland, 1982, $20.00.

TITLE Peatland Inventory Project - New Brunswick.

CONTRACT # In-house **COST**

ORGANIZATION Mineral Development Branch,
Dept. of Natural Resources,
P.O. Box 6000,
Fredericton, New Brunswick. E3B 5H1

PRINCIPAL INVESTIGATOR David Keys, Rod Henderson; (506) 453-2082

DURATION 1975-1982.

SPONSOR Canada Dept. of Regional and Economic Expansion and Province of New Brunswick.

SCIENTIFIC AUTHORITY D.E. Gemmell,
Energy Resources Geologist,
Mineral Development Branch,
Dept. of Natural Resources,
P.O. Box 6000,
Fredericton, New Brunswick.
E3B 5H1 (506) 453-2206.

OBJECTIVE

To determine the quantity and quality of the peat resource in the Province of New Brunswick. There are presently 18 peatlands leased for horticultural peat production and an interest in use of peat for fuel and industrial products. The majority of peatlands in the Province is on Crown lands and the Department of Natural Resources is responsible for their administration. The inventory provides the information necessary for efficient management and orderly development of the resource.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

- On peatlands with good potential for development a grid line network is cut and sites chained at 100 m. intervals along the lines. The elevation of each site is determined and a peat core is recovered and classified. Over 16,000 sites on 75,000 ha. of peatland have been investigated in this manner. On peatlands with lower development potential, the field survey consists only of recovery and classification of a peat core at sites located by traversing. Over 4,000 traverse points on 57,000 ha. have been investigated.

- The classification carried out at each site includes the botanical composition and von Post humification of each interval in the core; bottom sediment; surface vegetation (Radforth cover class) stump frequency; and several other factors.

- Maps at 1:10,000 scale showing peat depths and elevations are produced for each peatland. Cross-sections showing the distribution of peat types and decomposition degrees are produced for each grid line. A computerized data storage/retrieval system completes numerous calculations of volumes, average depth, etc. as well as producing cross-sections. Some 290 map sets are available.

- Selected sites on major peatlands are sampled for various physical and chemical analyses including: moisture content, bulk density, ash content, calorific value, sulphur, phosphorous, volatiles, a range of metals on both a dry peat and peat ash basis, and several other determinations.

STATUS AND COMMENTS

The field work for the project was completed in 1981. Final reports will be available early in 1983. All material is presently available on an open file basis. The data collected allows assessment of development options, and comparison of deposits for specific utilization requirements. Similar projects in Nova Scotia and Ontario are modelled after the methods used in New Brunswick.

REPORTS

Annual Open File reports summarize the results of each season's field work. These reports are being recompiled and updated on the basis of each 1:250,000 NTS map sheet. A major report summarizing the findings of the inventory, potential utilizations of the resource, descriptions of peatland types and characteristics, and survey methodology is in preparation. Several papers describing various aspects of the project have been prepared. The large volume of material available on an open file basis is dispersed mainly on the basis of specific requests for selected deposits. However, an information package giving examples of the types of material available can be obtained on request.

TITLE Sphagnum Bogs in Southern Manitoba.

CONTRACT # In-house **COST**

ORGANIZATION Geological Services Branch,
Manitoba Dept. of Energy and Mines,
993 Century Street,
Winnipeg, Manitoba
R3H 0W4

PRINCIPAL INVESTIGATOR Barry Bannatyne; (204) 663-9543.

DURATION 1976-77.

SPONSOR

SCIENTIFIC AUTHORITY

OBJECTIVE

To survey southern Manitoba for possible sphagnum peat reserves. No proper survey for fuel peat has been initiated due to abundance of other sources. Some interest in fuel peat exists as a potential source for remote communities.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Survey followed up on a somewhat unsuccessful 1962 preliminary survey of bogs based on black and white air photo interpretation. Recent survey was based on Canada Soil Survey information on the Riverton area plus Remote sensing infared imagery. Except for heavily-treed areas, coverage from the U.S. border to township 20 was obtained.

STATUS AND COMMENTS

Two bogs have been developed for horticultural peat in this area since the study was completed. All horticultural peat operations in the province are vacuum milling. Evergreen tried wet-harvesting one of the best bogs in the province but went into receivership and has been bought out by Western which has switched to pneumatic harvesting. In 1970, Manitoba produced $1M worth of peat (10-15,000 tons) In 1980, $7.5M was produced (68,232 tons).

REPORTS

Sphagnum Bogs in Southern Manitoba and their identification by remote sensing, B. Bannatyne, Mineral Resources Division of Manitobe Dept. of Energy and Mines, 993 Century Street, Winnipeg, Manitoba, R3H 0W4, 1979, Report ER79-7, $5.00.

"Preliminary survey of Bogs in Southeastern Manitoba", B. Bannatyne, Mineral Resources Division of Manitoba, Dept. of Energy and Mines, 993 Century St., Winnipeg, Report # 62-5, 1962, $1.00.

TITLE Peatland Resources of the Pacific Coast.

CONTRACT # **COST** $160,000. est.

ORGANIZATION
B.C. Pedology Unit,
Agriculture Canada,
6660 N.W. Marine Dr.,
Vancouver, B. C.
V6T 1X2

&

Land Resource,
Research Inst.,
Agriculture Canada,
920 Carling Ave.,
Ottawa, Ont.
K1A OC6

PRINCIPAL INVESTIGATOR Dave Moon, Corrine Selby (604) 224-4355 and Charles Tarnocai (613) 995-5011.

DURATION Spring 1982 to 31 March 1985.

SPONSOR Peat Forum.

SCIENTIFIC AUTHORITY
Dr. J.S. Clark,
Land Resource Research Inst.,
Agriculture Canada,
920 Carling Avenue,
Ottawa, Ontario.
K1A OC6 (613) 995-5011.

OBJECTIVE

1) To characterize various peatland types in the Pacific Coast Region on the basis of peat properties (type of peat material, morphology of peat, degree of decompsition, calorific values, etc.) water chemistry and vegetation.
2) To determine the dynamics and the rate of peat deposition of the main peatland types.
3) To determine the amount and quality of peat in the Pacific Coast Region.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	$50,000.		$50,000.
1983-84	$60,000.		$60,000.
1984-85	$50,000.		$50,000.

DESCRIPTION

The most common peatland types will be identified in the study area (Vancouver Island, the Queen Charlotte Islands and the Coastal mainland). These peatland types will be characterized by stratigraphy, physical and chemical characteristics, and hydrology. Field data concerning these peatland types will be collected along a transect. The peat stratigraphy will be determined, and the vegetation and hydrological conditions will be described. In order to achieve uniformity in data collections, the National Wetland Registry for will be used to record the data. The transects will be precisely plotted on small scale air photos to serve as reference sites. Data will be analysed by a computer method developed by D. Moon to characterize the peatland types.

The areal extent of the peatlands within the study will be determined from existing surveys and where no surveys exist, it will be estimated from satellite imagery. This areal information and the data generated during the transect study will be used to determine the amount of peat in the study area.

STATUS AND COMMENTS

1) Field work will be completed during the summers of 1982, 1983 and 1984.

2) Final report with maps (these maps are based on the already available inventory) and energy (fuel peat) estimates will be completed by 31 March 1985.

REPORTS

TITLE Les tourbières du sud de la Jamésie, Québec.
(The Peatlands of Southern James Bay, Québec.)

CONTRACT # **COST**

ORGANIZATION Le Groupe Dryade,
642 rue Saint-Cyrille ouest,
Québec, Québec.
G1S 1S8

PRINCIPAL INVESTIGATOR Pierre Grondin and Jacques Ouzilleau;
(418) 681-0687.

DURATION 1979 to January 1980.

SPONSOR La Société d'Energie de la Baie James.

SCIENTIFIC AUTHORITY Onil Faucher - Direction Environnement,
S.E.B.J., Place Dupuis, 8e étage,
800 est, boul. de Maisonneuve,
Montréal, Québec.
H2L 4M8

OBJECTIVE

The classification of the peatlands located in the southern part of the James Bay area. The classification is of peatlands located near principal bodies of water extending form lake Matagami in the south to Rupert River in the north and from Mistassimi Lake in the east to Rupert Bay in the west. A hierarchical system composed of three levels of perception was utilized: plant community associations, morphological units, and peatland types.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

This classification was carried out as part of the pre-project planning for the NBR (Nottaway, Broasback, and Rupert Rivers) Hydro-Electric complex. This study presented a new classification for peatlands which tended to be simple, adapted to photo-interpretation and appropriate for several purposes. 22 vegetation groups identified were named and described according to the dominant and subdominant species of several sampling sites. They can be recognized by an observer in the peatland - each group occupies a definite position along the shoreline. According to the different arrangements within these groups, the distribution of ponds, the vegetation structure and the vicinity of a water-side, 12 morphological units are identified. These units can be perceived by flying over the area at low altitude or by the photo-interpreter. At a higher altitude or by the photo-interpreter. At a higher level of recognition (observation from medium altitude) 6 peatland types are identified relative to their nutrient regime and topographical situation. Finally, an outlook of the shole area allows the designation of 5 peatland regions based upon the relative importance of morphological units and peatland types.

STATUS AND COMMENTS

REPORTS

Les toubières du Complexe NBR, Territoire de la Baie James, Québec, Le Groupe Dryade 1980 in two volumes. Vol. 1, 105 pp Vol. 2, maps. unpublished.

Les tourbières du sud de la Jamésie, Québec Pierre Grondin, Jacques Ouzilleau, Le Groupe Dryade, 1980. Géogr. phys. Quat., xxxiv, no. 3, pp. 267-299, 26 fig. dont 2 en poch., 7 tabl. dont 1 en poch., 1 app.

TITLE Inventaire des toubières du Québec.
(Inventory of Québec Peatlands).

CONTRACT # **COST**

ORGANIZATION Ministère des Richesses Naturelles,
Gouvernement du Québec.

PRINCIPAL INVESTIGATOR M. Jean-Yves Chateauvert; (418) 643-7513

DURATION

SPONSOR

SCIENTIFIC AUTHORITY M. Jean-Yves Chateauvert,
Ministère de l'Energie et des Ressources,
Gouvernement du Québec,
Service d'Analyse et Elaboration de Projets
1620 boul. de l'Entente,
Québec, Québec.
G1A 4N6 (418) 643-7513.

OBJECTIVE

To inventory the peatlands. In Québec, peat is a quarriable substance by law since 1 January 1966. Included under the Law on Mines, peat is considered an Industrial Mineral for tax purposes. Most bogs in the populated regions of the province are privately owned especially if suitable for horticultural peat production.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

A series of classic peatland studies were carried out by the Québec Department fo Mines, Laboratories Branch, beginning in 1950 with the "Clair" Peat Bog. Studies were conducted by J. Risi, C.E. Brunette, D. Spence, R. Cloutier, and H. Girard as a group. Some 70 to 90 peat specimens were chemically analysed each year according to various methods. For example in 1950, ether and alcohol extractions, humic acids, lignin, residual organic and inorganic matter, total ash and ash insoluable in 2% HCl were correlated to depth. Cold and hot water extractives, hemicelluloses and other substances, soluble in 2% HCl, cellulose, reducing substances in the hot water extract and the moisture content of the original samples were also correlated to depth.

Through the sixties and continuing to 1976, bogs in the populated regions of Québec were located on aerial photographs then surveyed and sampled by means of boreholing. Notes were made of surface vegetation. Most samples were of horticultural grade peat, usually H plus 1 to 4 - usually at least a metre at each hole. From 1964 to 1977 usually no more information than this exists. However, a few bogs were mapped by level and transit and bore holes were drilled approximately every 400 feet. Beginning in 1978, a new method of survey was adopted. Now more airphoto work is done in the office. Typical areas to be evaluated are chosen for onsite sampling and analysis.

Summer 1981 field work was conducted at Le Havre St-Pierre on the north shore of the St. Lawrence.

STATUS AND COMMENTS

Bog investigation is now becoming more chemical analysis oriented.

REPORTS

DP-292	Les Tourbières	12 p.	$1.20
DP-252	L'industrie de la tourbe du Québec	28 p.	$3.30
DP-291	Tourbe de sphaignes du Québec	6 p.	$0.60
ES-10	Ecologie de cinq tourbières du bas St-Laurent	25 p.	$1.00
ES-15	Les toubières de la partie habitèe des comtès de Roberval, Dubuc, Lac St-Jean et Chicoutimi	70 p.	$1.00
ES17	Les toubières du canton de Manicouagan	211 p.	$5.00
RP-590	Etude de tourbières de l'arcipel de Mingan	17 p.	$1.00
DP-0520	Torbières du comtè d'Arthabaska	37 p.	$3.70

Publications orders from Ministère de l'Energie et des Ressources

TITLE Peat Moss Resources and Some Associated Trace Elements in P.E.I.

CONTRACT # **COST**

ORGANIZATION R. Bruce Graham and Associates Ltd.,
54 St. Leonards Ave.,
Toronto, Ontario.
M4N 1K3

PRINCIPAL INVESTIGATOR R. Bruce Graham.

DURATION 6 months, 1973/74.

SPONSOR Tourism Dept. of Industry and Commerce, P.E.I.

SCIENTIFIC AUTHORITY

OBJECTIVE

To determine the quality of peat moss deposits.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Peat moss samples were taken from 15-20 bogs on P.E.I. Bog depths and megascopic features were recorded and recovered samples were analysed. Each sample was tested for absorption characteristics, both dry and with 25% moisture. pH, moisture, ash content and dry weights were recorded.
Evaluation of the bogs and their quantity was based on their horticultural potential.

STATUS AND COMMENTS

Study completed.

REPORTS

An unpublished report is available from Dept. of Industry and Commerce, P.E.I. A summary has been published.

TITLE Inventory of Peatlands in the Precambrian Shield

CONTRACT # **COST**

ORGANIZATION Ontario Centre for Remote Sensing,
Surveys and Mapping Branch,
Ministry of Natural Resources,
880 Bay Street, 3rd Floor,
Toronto, Ontario
M5S 1Z8

PRINCIPAL INVESTIGATOR S. Pala and A. Boissoneau.

DURATION 1981-ongoing.

SPONSOR Ontario Geological Survey, Ministry of Natural Resources

SCIENTIFIC AUTHORITY Dr. Simsek Pala and Art Boissoneau,
Ontario Centre for Remote Sensing,
Ministry of Natural Resources,
880 Bay Street, 3rd Floor,
Toronto, Ontario.
M5S 1Z8 (416) 965-8411.

OBJECTIVE

Produce maps in 1:50,000 scale for peatlands in the Precambrian Shield in Ontario according to the priorities set by the Ontario Geological Survey.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

LANDSAT data is digitally analysed and maps are produced with an Applicon colour plotter. The field sampling method has been developed using these maps.

STATUS AND COMMENTS

Maps are produced for the bogs west of Timmins and other areas are in the process of completion, according to the priorities set by OGS.

4.6.1 PEAT RESOURCE INVENTORY JAC 28/8/84

TITLE Characterization of Stored Peat in the Alberta Oil Sands Area.

CONTRACT # Project LS 5.2 **COST**
(Alberta Oil Sands Environmental Research Program)

ORGANIZATION Research Council of Alberta, Soils Division;
and Department of Soil Science, University of Alberta,
Edmonton, Alberta.
T6G 2J9

PRINCIPAL INVESTIGATOR J.D. Lindsay (Research Council of Alberta)
W.B. McGill and K. Kong (U. of Alberta)

DURATION 1976 - 1980.

SPONSOR Alberta Environment Dept. and Environment Canada.

SCIENTIFIC AUTHORITY J. Daws Lindsay,
Alberta Research Council,
11315 - 87 Ave.,
Edmonton, Alberta.
T6G 2C2 (403) 454-2290.

OBJECTIVE

To investigate the physical, chemical and biological characteristics of peat in the oil sands area, before, during and after storage, to establish handling and storage methods that ensure optimum quality of material available for reclamation. The open pit method of oil sands mining involves the stripping of an overburden of peat in much of the mineable area. The surface peat, which is stockpiled, is the only organic material naturally available for rebuilding soil fertility.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Peat was studied for its reaction to wetting, drying, freezing, thawing and the addition of nutrients in both the field and the laboratory. A peat pile was constructed at Evansburg, Alberta in 1976 and was monitored as a control for two years. A peat storage area also existed on the Syncrude Lease near Mildred Lake until early in 1978. The stored materials at Evansburg consisted entirely of peat whereas at Mildred Lake the materials were heterogeneous peat mineral mixtures which were grouped as follows:

group 1, peat predominant;
group 2, sand predominant;
group 3, sand-clay mixture;
group 4, peat-sand mixture.

Optimum temperatures for microbial activity in the storage piles occured near the surface and decreased with depth while optimum moisture conditions occurred near the 50 cm. depth. Frost penetration was not greater than 1 m. in any of the piles.

Physical, chemical and microbiological properties of stored materials were compared with those of fibric moss peat, mesic moss peat and mesic fen peat samples from undisturbed sites. Environmentally induced changes in peat properties were simulated in the laboratory by freeze-drying, air drying and thawing peat samples.. Air-drying and to a lesser extent freeze-drying, resulted in deterioration of physical properties and in reduction of microbial activity.

:::

STATUS AND COMMENTS

Relatively simple methods for the characterization of ash, carbon and bulk density of stored materials were used. Storage piles consisting of peat-mineral mixtures which had been fertilized had a somewhat higher level of microbial activity and organic matter decomposition than undisturbed peat or stored, relatively pure peat. Properties of the stored materials which were highly correlated with each other were: C, N, respiration rate, enzyme activily, cation exchange capacity, ash content, bulk dinsity, pore volume and water capacity.

:::

REPORTS

"Characterization of Stored Peat in the Alberta Oil Sands Area", K. Kong, J.D. Lindsay, W.B. McGill, prepared for the Alberta Oil Sands Environmental Research Program by Research Council of Alberta Soils Division and Dept. of Soil Science, University of Alberta, AOSERP Report 91, 1980, 116 pp.

TITLE Inventory of Peat Resource Feasibility Study - Manitoba

CONTRACT # In-house **COST** $2,0000

ORGANIZATION Manitoba Remote Sensing Centre,
Dept. of Natural Resources,
1007 Century Street,
Winnipeg, Manitoba,
R3H 0W4

PRINCIPAL INVESTIGATOR Bill Best, Chief of Map Distribution and Remote Sensing Section, (204) 945-6597 & D. M. Watson, Geological Services Branch, Department of Energy and Mines, (204) 633-9543 ext. 269.

DURATION 1982-1985

SPONSOR Manitoba Dept. of Natural Resources, and Dept. of Energy and Mines

SCIENTIFIC AUTHORITY Dr. David McRitchie,
Mineral Resources Div.,
Geological Services Branch,
Dept. of Energy and Mines,
993 Century St.,
Winnipeg, Manitoba.
R3H 0W4 (204) 944-6559

OBJECTIVE

To develop methods for the inventory of peatlands throughout Manitoba using remote sensing techniques: to establish their location and to clarify the various peatland ecosystems:

a) to extend the utility of the Landsat MSS digital data for peatland inventory to the Southeast Manitoba map sheet series.

b) to map classified peatlands within the study area at various scales (i.e. 1:250,000 and 1:50,000).

c) to compare costs and accuracy of digital techniques with ground-truthing and other verification procedures.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982	Province		$2,000
1983-85			?

DESCRIPTION

The Manitoba Remote Sensing Centre (MRSC) has been engaged in this feasibility study to determine remote sensing capabilities for mapping peatlands since 1982. 1:250,000 maps are to be produced of two areas in the province with peatlands outlined and showing interpreted classification to about 90 % confidence level. Primarily satellite data is being used although highlevel infrared airphotos are available for parts of the area to be mapped. Ground truthing will ensure that a reliable satellite image interpretation is being accomplished by study of known types of deposits in The Pas National Topographic series (NTS/63F) area. The methodology was established by 1982/83 and is being extended to the remainder of the map area.

STATUS AND COMMENTS

From 1982-1984 The Pas area north of Lake Winnipegosis and west to the Saskatchewan border was classified and inventoried. The southeast corner of the province is now being done.

REPORTS

Report of results, with maps showing bogs and their classifications are due by 1985.

4.6.1 PEAT RESOURCE INVENTORY JAC 28/5/84

TITLE Study of Peat Fluorescence Characteristics.

CONTRACT # 07SU 01525-7-0196 (OSU77-00316) **COST**

ORGANIZATION Institute of Aerospace Studies,
University of Toronto,
200 College Street,
Toronto, Ontario.
M5S 1A4

PRINCIPAL INVESTIGATOR Dr. R.M. Measures.

DURATION 12 Dec. 1977 to 1 March 1978.

SPONSOR Agriculture Canada.

SCIENTIFIC AUTHORITY Dr. H.K. Morita,
Soil Research Institute,
Research Branch, Agriculture Canada,
C.E.F. Ottawa, Ontario.
KiA OC6 (613) 995-3700.

OBJECTIVE

1) To obtain fluorescence spectra of some Canadian peats and ascertain whether spectra obtained by present instrumentation can be used to differentiate peats.
2) To obtain sampling variations which affect fluorescence.
3) If direct observation of fluorescence does not lead to meaningful results, then explore some of the chemical or physical treatments which can be used to enhance fluorescence of peats.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1977-78	Agr. Canada		$6,955.

STATUS AND COMMENTS

Dr. Morita is now working on micro-toxins in grain storage.

REPORTS

4.6.2

PEATLAND MINING

Developments in methodology and the technology used for bringing virgin peatland into production, and developments in the science and engineering associated with the extraction and handling of peat.

TITLE Bishop's Falls, Newfoundland Fuel-Peat Harvesting Demonstration.

CONTRACT # Canada-Newfoundland Demonstration Agreement **COST** $1.2M

ORGANIZATION Joint Venture: Memorial U. of Nfld., Lundregans Comstock Ltd., and Noval Technologies Ltd. (formerly called Algas Ltd.)

PRINCIPAL INVESTIGATOR Joint Venture Partners. Project Manager: Dave Rees, Noval Technologies, (709) 722-2815

DURATION June 1979 - Dec. 31, 1982 (?)

SPONSOR Conservation and Renewable Energy Branch, EMR and Joint Venture Partners.

SCIENTIFIC AUTHORITY
John D.C. Waller, Manager,
Biomass ENERDEMO Canada,
Conservation and Renewable Energy Branch,
Energy, Mines and Resources,
460 O'Connor Street,
Ottawa, Ontario,
K1A 0E4 (613) 995-9447

OBJECTIVE

To demonstrate the feasibility of harvesting fuel peat in Newfoundland using conventional technology. Feasibility includes economic, engineering, and socio-political considerations. Fuel peat is to be sold to Abitibi Price in Grand Falls, Newfoundland as a replacement for five million gals. of the up to 12 million gals. of oil used annually by Abitibi Price (Nfld.) Ltd.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1979-82	$817,000	$547,000	$1,364,000
Env. Assess. Study:	$41,000		$41,000

DESCRIPTION

Montreal Engineering (Monenco) did pre-engineering for the project from June until October 1979. This work entailed site selection, transport system and mine plan. Shawmount, the Newfoundland subsidiary of Monenco, supervised the first phase of ditching as well as road construction of a nylon-fabric floating bog road. Beginning in July 1980, Memorial University took over control of the project. In June 1981, Turveruukki, O.Y., a Finnish peat firm, was retained to advise on production techniques. An extensive economic and environmental assessment was made of the project under separate contracts: Nfld. Dept. of Mines plus Envir. Canada, Nfld. Forest Research Ctr. and E.P.S. are supervising the economic and environmental assessment which is being conducted apart from the actual demonstration. Co-ordinator of this study is Phil Graham, Dept. of Mines and Energy, Eastern Canada Bldg., Bonaventure Ave., St. John's, Newfoundland, A1C 5P7, (709) 737-2411.

STATUS AND COMMENTS

Project is providing experience for engineers, scientists, management and industry. Considerable difficulty with equipment and weather was encountered in the first year. Ideally, full-scale harvesting should not commence the first year after drainage. Weather and equipment functioning has been more successful in 1981 season. Both milling/ridging technology and pneumatic vacuum harvesting are being demonstrated.

Based on about 6 weeks of initial vacuum harvesting and about 9000 m3 harvested, projected annual production might be 120 tonnes/hectare. With the Haku method, based on 30 hectare production again, similar production figures were reached of 3,000 m3 over three weeks.

REPORTS

Comprehensive report is to be published upon completion of the project describing all aspects of the feasibility demonstration. The economic and environmental assessment of the project will be published separately. Reports will not be available until after the completion of the project.

D. Depper of Scott Films, 1716 Woodward Dr., Ottawa, Ont., (613) 226-4501 produced a 5 minute film on this project.

Interim Report: J.B. Scott, D. Rees and E. Korpijaakko. "Newfoundland Fuel Peat Demonstration Project" *Proceedings of the 6th International Peat Congress of the International Peat Society*. Duluth, Mn., August 17-23. 1980; and D.G. Rees. The Newfoundland Fuel Peat Project. *Proceedings of Symposium on Peat - An Awakening Natural Resource*, Oct. 26-28, 1981: available from Canadian National Committee of International Peat Society.

TITLE Sod Peat Harvesting Project, St. Shotts, Newfoundland.

PROJECT # 571:06:03:04:16 **COST** $700,000

ORGANIZATION South Avalon Development Association,
St. Shotts, Newfoundland. A0A 3R0
(Raymond Molloy (709) 438-2454)

PRINCIPAL INVESTIGATOR Project Manager: Pat Hewitt.

DURATION July 1982 - March 1985

SPONSOR Conservation and Renewable Energy Development Agreement - Energy Mines and Resources, Canada Employment and Immigration, Mines and Energy (Nfld.), Rural, Agricultural and Northern Development (Nfld.).

SCIENTIFIC AUTHORITY John Waller, Energy Mines and Resources,
460 O'Connor Street, Ottawa, Ontario.
K1A 0E4 (613) 995-9447

Alex Winsor, Nfld. Mines and Energy Dept,
P.O. Box 4750, St. John's, Newfoundland,
A1C 5T7 (709) 737-2411

OBJECTIVE

To demonstrate the economic feasibility of producing sod peat for fuel from the blanket bogs of the Southern Avalon and Burin Peninsulas as a viable economic alternative to oil in the area. Target market includes home, industrial, commercial, and institutional facilities.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
	All Depts.		
1982-83	$328,400		$328,400
1983-84	$172,000		$172,000
1984-85	$200,000		$200,000

DESCRIPTION

A 15 hectare section of the St. Shotts pasture will be brought into sod peat production over a two year period. The sods will be transported to the local residential market. Future expansion to a commercial-sized operation (45 ha. minimum) would also supply the Fishery Products Fish Plant in Trepassey as well as other industrial and commercial/institutional facilities in the area. Development will proceed according to the following stages:

1) drainage of 15 hectares by perimeter and production ditches;
2) rotovating and profiling of drained bog surface.

Production then proceeds with:

1) air drying of extruded peat in field;
2) ridging of sods and loading into bog wagon to be stockpiled;
3) distribution of fuel peat to end-users.

STATUS AND COMMENTS

Bog Survey has been conducted. A marketing study is currently being prepared by Newfoundland Dept. of Mines and Energy. A Technical Report will be prepared by the Southern Avalon Development Association. Report is due early in 1985. For more information contact Nfld. Dept. of Mines and Energy, Phil Graham or Alex Winsor.

REPORTS

Fuel Peat Combustion Test
Marketing Report

TITLE Study of the Technology and Costs Associated with Dredging and Overburden Clearing Operations for the Recovery of Peat.

CONTRACT # 01SX.31155-1-2643 **COST**

ORGANIZATION Kesmark Ltd.,
243 Consumers,
Toronto, Ontario.

PRINCIPAL INVESTIGATOR G.B. Morris; (416) 493-2770.

DURATION 1981-82.

SPONSOR National Research Council, Ottawa.

SCIENTIFIC AUTHORITY T.E. Tibbetts,
Peat Program Manager,
N.R.C. Atlantic Research Labs.,
1411 Oxford Street,
Halifax, Nova Scotia.
B3H 3Z1 (902) 426-7532

OBJECTIVE

To undertake a study of the technology and costs associated with the dredging of peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

To provide the following:

1) Description of site preparations, dredging operations and preliminary treatment (eg. drying, stock-piling) of peat. This description shall include an evaluation of general operating constraints and shall cover both summer and winter operations.

2) Description of the production capacity, power requirement and other pertinent specifications for equipment required for the processes described in #1 above. Where possible, this description shall include both rated and actual performances.

3) Provision of the life cycle costs of the equipment described in #2 above; including such items as capital costs, maintenance costs, operating costs, expected lifetime, approximate time between failures and level of training required for operation.

4) Evaluation of the effect of scale on unit costs.

To perform this study by:

a) providing such relevant information as is available from various personnel and records of McNamara Construction, a member of the Kesmark Ltd. group.

b) visiting selected suppliers and attending peat seminars in order to update information on recently developed equipment.

STATUS AND COMMENTS

Project complete; report submitted to N.R.C.

REPORTS

Study of the Technology and Costs Associated with Dredging and Overburden Clearing Operations for the Recovery of Peat. March 1982. Available from Peat Program Manager.

TITLE Commercial Development of Technologies for the Wet-Harvesting and Dewatering of Peat in Canada.

CONTRACT # **COST**

ORGANIZATION Fison-Western Peat Moss Ltd.,
1200-805 West Broadway,
Vancouver, B.C.
V5Z 1K1

PRINCIPAL INVESTIGATOR Charles Carncross and John Dunfield; (604) 873-3201.

DURATION late 1940's to 1983

SPONSOR private capital plus some NRC funds.

SCIENTIFIC AUTHORITY

OBJECTIVE

Commercial wet-harvesting and dewatering of peat at Burn's Bog, Delta, B.C.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Fison-Western Peat Moss Ltd. is one of the world's largest horticultural peat operations. They harvest peat in Canada and in Europe. Their operation is on Burn's Bog in Delta, B.C. While not Fison-Western's only operation in Canada, it has been active since the 1940's. At first peat was cut by hand and taken off in wagons. Peat was exported to the U.S. during the Second World War. Peat was moved off the bog by a railway built on the bog. Both dragline harvest and vacuum-harvest have also been tried at this bog. Because of minimal availability of sun for solar drying, emphasis has been directed to the development of wet-harvesting for this location. Present method consists of a hovercraft barge (developed with assistance from N.R.C.) which floats in a pond excavated in the bog. A clam-shell bucket mounted on the barge digs peat out of the side of the pond and dumps into a hopper also mounted on the barge. Peat is pumped in a slurry through a pipe to a dewatering plant located off the bog. The wet-peat is squeezed through rollers between two belts of nylon fabric and then squeezed further in an Ingersoll-Rand Vari-Nip Press Machine. The peat is then flash dried to 50% moisture in a cyclone drier. This operation is the most technologically advanced of its kind in Canada.

STATUS AND COMMENTS

Charles Carncross has attended Canadian and International Peat Symposia for years. He has published a number of papers of which one is listed below. Recent studies indicate rising labour and energy costs require a larger scale operation to be economically competitive with regions where solar drying is cost-effective. Mr. Carncross and Mr. Dunfield have recently retired from Fison-Western and the Burns Bog operation has been closed down.

REPORTS

Charles A. Carncross (1979), "Recent Developments in the Technical Dewatering of Peat", in *Proceedings of Canadian Peat Symposium*, August 16, 1979 held at UNB, Fredericton. Proceedings available through N.R.C. Peat Program Manager, Ted Tibbetts or CISTI.

TITLE Machinery for Peat Harvesting and Packaging for Commercial Peat Operations.

CONTRACT # **COST**

ORGANIZATION Les Equipments Tardif Inc.,
55, RR 1 St-Antonin,
Cté, Rivière-du-Loup, Québec
GOL 2J0 telex # 0513911

PRINCIPAL INVESTIGATOR Leonard Tardif; (418) 862-7574
(anglophones ask for Roger Roy)

DURATION 1967 - ongoing.

SPONSOR privately funded.

SCIENTIFIC AUTHORITY

OBJECTIVE

To develop equipment for harvesting, packing and shipping peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Les Equipments Tardif has developed machines for stump and root-picking, vacuum-harvesting peat, wagons for carrying it from the field, harrows and conditioners for enhancing solar drying, screens (rotating and vibrating) for removing wood and roots from peat prior to bagging, a crusher mill to size components too big for bagging, an automatic bagging and pressing machine and conveyer system for handling the bagged peat. This equipment is in use in North America, Europe, and New Zealand. The company is interested in devoting some of its expertise to the challenges of fuel peat and works closely with Tardif et Frère Inc. Les Equipments Tardif is also interested in acting as consultant people in the peat industry (e.g. to establish new peat harvesting operations or to specify appropriate machinery for specific jobs).

TITLE Bog-Development Machinery for Commercial Peat Operations.

ORGANIZATION Tardif et Frère Inc.,
62 boul. Cartier,
Rivière-du-Loup, Québec.
G5R 3Y4

PRINCIPAL INVESTIGATOR Jean Roche Tardif & brother.
(anglophones ask for Clarence Breau).
(418) 862-7273.

DURATION 1967 - ongoing.

SPONSOR privately funded.

SCIENTIFIC AUTHORITY

OBJECTIVE

Tardif et Frère has had 15 years experience in research and transformation of machinery for the preparation, drying, drainage, and general uses of peat moss production. The firm is a dealership for Massey-Fergusson, Case, Dond, Dalla Bona, Kubota, Allied Farm, Forano, and other companies.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Tardif et Frère Inc. have been operating their own horticultural peat bog S.W. of Rivière-du-Loup since 1969. They modify, adapt and develop machinery for use in horticultural peat production. After testing on their own bog, they sell to markets in North America and abroad. They have a conversion kit for converting a MF 275, 80 HP tractor which gives it flotation and manoeuverability over wet bogs. They have adapted it to an available ditcher unit which they market. They have also developed equipment for bog levelling and clearing. While their experience is in horticultural peat, they are interested also in fuel peat. They work closely with Leonard Tardif's Les Equipments Tardif.

TITLE Development of Design Parameters for Peat Slurry Pumping/Transport.

CONTRACT # 02SX.31926-3-0114 **COST** $102,200.

ORGANIZATION Monenco Ontario Limited,
155 Rexdale Blvd.,
Rexdale, Ontario,
M9W 5Z8

PRINCIPAL INVESTIGATOR Dr. Boris Gelfer, (416) 743-3456

DURATION January 1984 to October 1984.

SPONSOR National Research Council.

SCIENTIFIC AUTHORITY T.E. Tibbetts,
NRC Atlantic Research Labs.,
1411 Oxford Street,
Halifax, N. S.
B3H 3Z1 (902) 426-7532.

OBJECTIVE

To study peat slurry rheology of several selected Canadian and U. S. peats and to develop calculating techniques for determining main peat slurry pumping and pipelining parameters.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	N.R.C.	Monenco	$ 5,000.
1984-85	N.R.C.	Monenco	$97,000.

DESCRIPTION

- Collection of various peat samples from different locations in Canada and the U.S. (e.g. Sask., Ont., N.B., N.Y. etc.);
- Develop calculating methodologies to determine optimal solids concentration, maximum pump capacity, minimum pipeline diameter and maximum single stage pumping distance.
- Develop laboratory procedure and equipment to conduct peat slurry viscosity measurements;
- Develop calculating methodologies to determine optimal solids concentration, maximum pump capacity, minimum pipeline diameter and maximum single stage pumping distance.

STATUS AND COMMENTS

Project completed.

REPORTS

Development of design parameters for peat slurry pumping and pipeline transport. October, 1984.

Available from peat program manager, NRCC.

TITLE Evaluation of Alternative Wet Peat Mining Systems.

CONTRACT # 01SX.31155-2-2608 **COST** $68,735.

ORGANIZATION Monenco Ontario Ltd.,
155 Rexdale Blvd.,
Rexdale, Ontario.
M9W 5Z8

PRINCIPAL INVESTIGATOR G.W. Mankinen, (416) 743-3456

DURATION April - September 1982

SPONSOR National Research Council

SCIENTIFIC AUTHORITY T.E. Tibbetts, Peat Program Manager,
N.R.C. Atlantic Research Laboratory,
1411 Oxford Street,
Halifax, Nova Scotia.
B3H 3Z1 (902) 426-7532.

OBJECTIVE

1) Review and assess the potential for Canadian conditions of wet mining practices in the past and current wet mining systems in place and proposed;
2) Study a mining system suitable to medium and large scale peat processing applications by excavating the *in situ* drained peat and including such bog transport systems as slurry pumping, vehicles, conveyors, etc.;
3) Study a wet mining system operating in an undrained peat deposit other than dredging that yields a 2-3% pumpable slurry and best suited for small or medium scale peat processing operations.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	N.R.C.	Monenco	$51,000.
1983-84	N.R.C.	Monenco	$17,000.

DESCRIPTION

The project included:

1) a review of existing information and published literature;

2) specialist input on the application of slurry pipelines and pumping technology as well as on equipment design and mobility aspects for bog equipment that may operate on a continuous basis;

3) a technical assessment of mining methods, equipment, and equipment compatibility with weather and bog surface conditions as well as the end-use of the product. Products will be marked with the feedstock quality requirement for various peat processes;

4) evaluation of on-bog transport system to adjacent processing plant, and consider pumping aspects specifically related to peat;

5) cost information, select a system best suited to Canadian fuel peat production with assumptions influencing the selection. Capital and operating costs to be prepared, and economies of scale presented as well as mobile and fixed equipment listed with capacity ratings for wet peat conveying and pipeline systems;

6) a final report complete with a technical and economic assessment of the wet mining techniques; a comparison of wet versus dry mining economies; plus recommendations for the most suitable methods.

STATUS AND COMMENTS

Project completed 1983.

REPORTS

"An Evaluation of Alternative Wet Peat Mining Systems," Monenco Peat Group, Monenco Limited, Report no. NRCC 230/6. (available through Peat Program Manager).

PEAT DEWATERING/PROCESSING, COMBUSTION AND CONVERSION TECHNIQUES

A virgin peat bog contains about 97% water and 3% peat solids by weight. A drained bog yields 92% moisture peat. To use peat as a fuel, the moisture content is reduced below 55%. Various technologies are being investigated to accomplish this reduction. Involvement in medium and large scale chemical and gas production from Canadian peat is also a consideration.

TITLE Lameque Peat Boiler Tests.

CONTRACT # **COST**

ORGANIZATION ADI Ltd.,
1115 Regent Street,
Fredericton, New Brunswick.

PRINCIPAL INVESTIGATOR John Dean; (506) 452-9000.

DURATION September to December 1980.

SPONSOR EMR and NRC.

SCIENTIFIC AUTHORITY Dr. George K. Lee,
CANMET,
Energy, Mines and Resources,
c/o 555 Booth Street,
Ottawa, Ontario.
K1A 0G1

OBJECTIVE

To determine the efficiency under various thermal load conditions of a 500 horsepower peat-fired boiler system located in Lameque, New Brunswick. Included in the study was an investigation of firing the boiler with wood residue (sawdust). Although the peat-fired plant was successfully commissioned in 1976, it did not have a heat load. For four years the plant was maintained in a "ready to operate" condition and it was started a number of times for for demonstration purposes. However, the plant had never been fully tested for efficiency under various thermal load conditions prior to this study.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

The efficiency of the boiler system under various load conditions was tested according to ASME PTC 4.1 - 1964. This method is based on the accurate determination of all heat credits and accountable losses. The output and efficiency is calculated as follows:

Output = Heat credits - accountable losses

$$\text{Efficiency} = 100 - \frac{\text{accountable losses}}{\text{heat credits}} \times 100$$

The usual method for calculating heat credits and accountable losses is by expressing all credits and losses in terms of Btu/lb of "as fired" fuel. The data required for this method are:

a) fuel analysis;
b) flue gas composition or analysis for CO2, CO and O2;
c) flue gas temperature determined as a result of a velocity and temperature traverse of the cross-sectional area (see #);
d) temperature of air supplied to unit for combustion ;
e) combustible content and quantity of dust carried by exit gases (see #);
f) combustible content and quantity of ash;
g) temperature of fuel supplied at point of entering unit (thermometers placed in pre-weighed peat piles);
h) humidity of air supplied for combustion;
i) radiation (surface temperature of unit at various points). A composite sample was sent to EMR CANMET Energy Research Labs for proximate and ultimate analysis as well as calorific content. Ash samples were analysed by ADI and EMR.

# testing carried out by N.B. Research and Productivity Council.

STATUS AND COMMENTS

Fuel peat available had been harvested in summer 1975. Thus although boiler was rated at 500 hp. for 50% moisture content peat. The actual peat used had a moisture content of 65% and was decomposed to the extent that ash content was increased. Thus only 45% of rated power was obtained, fired peat tested at 7870 Btu/lb. and 13.8% ash content on a dry weight basis, compared with earlier values of 9103 Btu/lb. and 2.9%. Early measurements with limited metering and instrumentation available had determined an efficiency of 70%.

REPORTS

- "Report on Lameque Boiler for National Research Council", A.W.G. Miller, p.eng., ADI Ltd., File 1826-2, Dec. 1980, 19 pp. plus appendices.
- Report includes a brief history of the facility and a description of its design, a description of testing methods and equipment, testing programme discussion of results for peat tests and sawdust tests, conclusion and recommendations, plus appendices on blower and fan operating information, laboratory analysis and sample calculations of data for peat/sawdust tests.

TITLE Buffalo Narrows Fuel Peat Demonstration Project.

CONTRACT # **COST** $390,000.

ORGANIZATION Monenco contracted through:
Saskmont Engineering Co. Ltd.,
2 St. Claire Ave. E.,
Toronto, Ontario.

PRINCIPAL INVESTIGATOR W. Mankinen and E. Korpijaakko;
(416) 961-4590.

DURATION 1981 to 1983.

SPONSOR Federal-Provincial Conservation and Renewables Demonstration Program.

SCIENTIFIC AUTHORITY Paul Guliov (Project Manager),
Saskatchewan Energy and Mines,
1914 Hamilton Street,
Regina, Saskatchewan.
S4P 4V4

OBJECTIVE

1) Demonstrate bog drainage and preparation.

2) Demonstrate the extruded sod peat mining technique on a fuel peat bog in the Buffalo Narrows area.

3) Demonstrate the use of extruded sod peat for domestic heating.

4) Assess the economic and technical aspects of utilizing peat for domestic heating as compared with oil heating.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-83	CREDA 50%	PROVINCE 50%	$390,000.

DESCRIPTION

Sod peat was used to heat four homes and the municipal garage in Buffalo Narrows during the winter of 1982-83. The fuel was produced at a demonstration bog 11 km south of town.
Project Phases:

1) Bog Surveys;
2) Bog drainage;
3) Purchase of peat furnaces and Finnish sod peat fuel;
4) Run-in period for peat furnaces and Finnish sod peat fuel;
5) Preparation of demonstration bog surface;
6) Production of fuel peat from demonstration bog;
7) Utilizing local fuel peat in test-furnaces for domestic heating during one full heating season;
8) Monitoring of test homes;
9) Economic and technical analysis of fuel peat production and utilization.

STATUS AND COMMENTS

The final project report is available as Open file #84-22 from Sask. Energy and Mines publication office. Cost: $10.

REPORTS

- Assessment of Technical and Economic Feasibility of Peat Resource Development in Northern Saskatchewan Communities, Saskmont Engineering Co. Ltd. (Monenco), 1978, unpublished, 200p.
- Buffalo Narrows Peat Utilization Study. Saskmont Engineering Co. Ltd. (Monenco) Spring, 1981. 200p. Saskatchewan Publications Office, Open File OF81-2.
- Buffalo Narrows Fuel Peat Demonstration Project, Saskmont Engineering Co. Ltd. (Monenco) 1984. 234p. Saskatchewan Energy and Mines Open File OF84-22.

TITLE Small Gasification Demonstration - Ontario.

CONTRACT # 8503 **COST** est. $1,000,000.
(equipment and operations)

ORGANIZATION Canadian Energy Development Systems
International Inc.,
302 The East Mall, Suite 600,
Toronto, Ontario.
M9B 6C7

PRINCIPAL INVESTIGATOR Stephen Graham (CEDSI);
(613) 733-2100.

DURATION 2 May 1982 - 31 December 1985.

SPONSOR Ontario Ministry of Energy (Phase 1)
OME, PetroSun Corporation (Phase 2)

SCIENTIFIC AUTHORITY Scott Stevens, Project Leader,
Renewable Energy Branch,
Ontario Ministry of Energy,
Queens Park,
Toronto, Ontario.
M7A 2B7 (416) 965-8060.

OBJECTIVE

To select, manufacture, install, commission, monitor and demonstrate a 400 kW gasifier/genset in a remote settlement.
To demonstrate the cost feasibility and reliability (over one year of monitoring) of a small gasifier and engine to generate electricity for remote communities.

FUNDING

Fiscal Year	Sponsor	Contractor		Total
	O.M.E.	PetroSun	E.M.R.	
1982-83	$150,000.	$100,000.	$100,000	$350,000.
1983-84	$100,000.	$200,000.	$100,000.	$400,000.
1984-85	$ 50,000.	$150,000.	$ 50,000.	$250,000.
				$1,000,000.

DESCRIPTION

Phase 1:
- review of commercially available systems;
- select most important appropriate systems from world-wide tendering process;
- identify and cost of feedstocks;
- prefeasibility analysis of selected Ontario isolated community.

Phase 2:
- negotiation with manufacturer PertroSun, Montreal/National Synfuels, Jacksonville, Florida;
- procure equipment, modify and develop;
- manufacture and assembly of unit in Montreal (PSI in Longueuil, Québec);
- monitor performance (technical operations) over an extended period of operation in Montreal, to debug, calibrate and modify.

Phase 3:
- install, operate and monitor on a utility basis in a selected Ontario remote community for one year;
- report on cost feasibility, reliability, output using, chips, wood wastes, peat, densified fuel;
- feasibility of installing in remote community to generate electricity.

STATUS AND COMMENTS

Phase 1 complete.
Phase 2 nearing completion. Unit assembled and now waiting for start-up and final monitoring in Montreal.
Phase 3 complete by July 1985.

REPORTS

1) Feasibility Study and Equipment Selection, 1983.
2) Technical Report, November 1984.
3) Monitoring Report, May 1985.

TITLE Study of the Pretreatment Preparation of Forest Biomass as Feedstock for Bioconversion Processes.

CONTRACT # KL299-1-4121(OSS81-00026) **COST** $129,221.

ORGANIZATION University of Waterloo,
Waterloo, Ontario.
N2L 3G1

PRINCIPAL INVESTIGATOR Dr. Murray Moo-Young,
(519) 885-1211 ext. 3919.

DURATION May 1981 to April 1983.

SPONSOR Environment Canada.

SCIENTIFIC AUTHORITY Dr. S.M. Martin, Ret.,
Division of Biological Sciences,
National Research Council,
Room 3024,
Sussex Drive,
Ottawa, Ontario.
K1A 0R6 (613) 992-2367.

OBJECTIVE

To develop and test a novel process whereby forest biomass (such as wood, pulpmill sludge) is covered by chemical hydrolysis, enhanced by gamma irradiation or microwaves, into a liquid product which is suitable as feedstock for known conversion technologies in the production of industrial chemical and fuels. The aim is economic production of feedstocks.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82	$58,000.		$58,000.
1982-83	$65,931.		$65,931.
1983-84	$ 5,290.		$ 5,290.

DESCRIPTION

The project will cover two main areas of study:

1. Experimental development of the pretreatment method for optimal depolymerization, sugar yields and conversion rates. The effects of irradiation dosage, particle size and chemical strength will be tested in actual bioconversion processes to gain insight in its suitability.

2. Economic evaluation of the method as it compares to existing feedstock availability and other pretreatment methods for a range of conversion technologies. Computer programs will be developed for various sensitivity analyses.

STATUS AND COMMENTS

Peat is also being investigated as a feedstock.

REPORTS

TITLE Study of the Biogasification of Peat.

CONTRACT # Project 1264-13 **COST**

ORGANIZATION A.D.I. Limited,
1115 Regent Street,
Fredericton, New Brunswick.

PRINCIPAL INVESTIGATOR John Dean; (506) 452-9000.

DURATION 1981-82.

SPONSOR National Research Council, Ottawa, Ontario.

SCIENTIFIC AUTHORITY T.E. Tibbetts,
Peat Program Manager,
N.R.C. Atlantic Research Labs.,
1411 Oxford Street,
Halifax, Nova Scotia.
B3H 3Z1 (902) 426-7532.

OBJECTIVE

1. to identify the recent development in the area of biogasification of peat for energy production;
2. to examine those biogasification processes in terms of technical and economic feasibility;
3. to recommend a future course of action related to biogasification in the context of the peat-to-energy programme in Canada.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

1.a) Assemble a Source list of the work to date on anaerobic digestion of peat.
  b) Prepare a critical evaluation of the sources listed in (a) and prepare an annotated bibliography.

2. Undertake visits to Institute of Gas Technology (IGT) in Chicago, Illinois and Dynatch R/D in Cambridge, Massachusetts, to discuss the status of current research and to establish, where possible, the planned future directions of these research efforts.

3.a) Review the capital and operating costs of proposed processes, updating published estimates by means of the Consumer Price Index and utilize life cycle costing techniques for economic comparison.
  b) Include estimates of process efficiencies and consideration of the disposal of effluent problems and the possible beneficiation of non-digested residues.
  c) Provide comparison with other peat utilization schemes based on data available with ADI and other sources.

4.a) Prepare a draft report outlining the work carried out.
  b) Prepare a final report incorporating the feedback from the client.

STATUS AND COMMENTS

Study completed; report submitted to N.R.C.

REPORTS

Report on a Study on the Biogasification of Peat. March, 1982. NRCC 20600.

Available from Peat Program Manager.

TITLE Assessment of Peat as an Alternative Fuel for Power Generation. Phase III.

CONTRACT # 15SQ.23440-8-9039 (0SQ78-00163) **COST** $131,387.

ORGANIZATION Montreal Engineering Company Limited, (MONENCO),
CORBLOC, 80 King Street,
P.O. Box 1540,
St. Catherines, Ontario.
L2R 7J9

With assistance from ADI Ltd., Fredericton, N.B.

PRINCIPAL INVESTIGATOR A. Ismail, P. Eng.; (416) 688-9263.

DURATION 7 December 1978 - 15 February 1980.

SPONSOR Energy, Mines and Resources.

SCIENTIFIC AUTHORITY T.E. Tibbetts, Peat Program Manager,
NRC Atlantic Research Laboratory,
1411 Oxford Street,
Halifax, Nova Scotia.
B3H 3Z1 (902) 426-7532.

OBJECTIVE

To determine the economic feasibility of building and operating a 40 MW peat-fired steam generating plant under Canadian conditions with specific reference to Northeastern New Brunswick.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1979-80	EMR	Monenco	$131,387.

DESCRIPTION

Peat is not used at present in Canada for fueling thermal power plants. However, Ireland, Finland and the USSR use peat for this purpose.

This generating feasibility study is the third phase in a peat assessment program being carried out by Monenco. Earlier studies established the existence of substantial fuel peat resources in Canada, identified specific sites in New Brunswick and Québec, and determined that peat deposits in northeastern New Brunswick could support a 40 MW generating plant.

The New Brunswick Electrical Power Commission (NBEPC) is interested in utilizing peat as fuel and has confirmed that a 40 MW peat-fired plant could fit into its power grid.

It is hoped that this third phase in studying the feasibility of using peat for power will establish the basis for a federal-provincial utility agreement for the exploitation of domestic peat. The study will have the following scope:

a) a conceptual design for the Shippegan area emphasizing the use of Canadian equipment and use of standard modules for the major components of the plant;

b) a characterization of the chemical and physical properties of the New Brunswick fuel peat as a basis for selection of the boiler design and the peat mining, transportation, receiving, storage and handling system which must be detailed and costed;

c) estimates of the capital and operating costs for an integrated demonstration of the technical and economic viability;

d) as assessment of the probable direct and indirect environmental impacts of the integrated peat mining/power generating system;

e) a preliminary assessment of the economic viability.

STATUS AND COMMENTS

Project was completed and report submitted.

REPORTS

Feasibility Study for a Peat-fired Steam-electric Power Station with Specific Reference to N-E New Brunswick, May 1980, Monenco Ltd. Available from Micromedia Ltd., 144 Front Street West, Toronto, Ontario. M5J 2L7

TITLE Avant-projet d'amenagement d'un gazogène moteur de 720 kW à Port Menier, Ile d'Anticosti.
(Pre-project Development of a 720 kW Biogas Generator at Port Menier, Anticosti Istand).

CONTRACT # 08710-RA-83/32 **COST** $1,700,000.

ORGANIZATION various.

PRINCIPAL INVESTIGATOR

DURATION 3 years, final publication in 1983.

SPONSOR Hydro-Québec

SCIENTIFIC AUTHORITY J. Belleau, V.B. Quach and G. Slupik,
Direction ingènierie de centrales,
855 est, rue Ste-Catherine,
14e ètage, Place Dupuis,
Montréal, Québec.
H2L 4P5

OBJECTIVE

1. Study a peat-fuelled biogasification generator able to satisfy the energy requirements of Port Menier.
2. Study the preparation and exploitation of peatlands able to furnish a sufficient quantity of good quality fuel. (20,000 m3 of peat rolls in annual production).
3. Select biogas generators with power to partially meet the needs of the programme of unrelated network. This programme expects, by the end of 1986, that the energy production units would be as follows:
    one biogas generator- 770 W (900 kVA),
    two classic diesels- 800 W each.
4. Choose site of thermal power station.
5. Choose peatlands to fuel engine.
6. Establish operational criteria for the experimental section.
7. Define programme for achieving objectives.
8. Submit a cost estimate of project.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

STATUS AND COMMENTS

biogas generator- inquiring into the various manufacturers showed little guarantee for the performance of different proposed types of engines

peatlands- inventory of Port Menier area revealed the inadequacy of these deposits to assure sufficient annual production of peat rolls, especially due to the climactic factor that directly regulates its exploitation.

REPORTS

one volume.

TITLE Solvolyse et fractionnement sélèctif de la tourbe.
(Solvolysis and Selective Fractionation of Peat)

CONTRACT # 0S482-00418 **COST** $248,182.

ORGANIZATION Chemical Engineering Department,
Faculty of Applied Science,
Université de Sherbrooke,
Sherbrooke, Québec.
J1K 2R1

PRINCIPAL INVESTIGATOR E. Chornet; (819) 565-4320.

DURATION April 1983 to March 1985.

SPONSOR National Research Council Canada.

SCIENTIFIC AUTHORITY Dr. R.P. Overend
Bioenergy Program, Division of Energy R & D
National Research Council
Ottawa, Ontario.
K1A 0R6 (613) 993-1342.

OBJECTIVE

1- Selective conversion of the peat complex of hydrocarbons and humic acids with the aim to change the hydrophilic nature of the peat.

2- Application of fractionation to the dewatering of peat in one stage while continuing the development of a novel process for valorisation of peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	NRC	U & S	$121,363.50
1984-85	NRC	U & S	$127,116.67

DESCRIPTION

Experimental strategy comprised:

1- development of characterization procedures;

2- controlled experiments in simulated cascade reactors
 - operation of reactor
 - elevated shear forces were obtained by means of calibrated openings;

3- experiments on maceration and pumping in order to determine rheological parameters;

4- experiments in the "process development unit" (PDU) with a capacity of 1 l/min.;

5- study of filterability of peat treated by pressage and centrifuge.

STATUS AND COMMENTS

The program to date has established:

a) A hydrolysis controlled by action of shear force;

b) Pumping concentrated suspensions (9 - 12% solids) was done in a standard way and rheological results were obtained.

REPORTS

Annual report presented 21 June 1984, covering the fiscal year 1983/84.

TITLE Mise au point d'un prototype solaire pour le traitement de la tourbe horticole (UP-P-91).
(Development of a Solar Dryer Prototype for Horticultural Peat Treatment).

CONTRACT # 09SD.01756-0-230 **COST** $74,660.

ORGANIZATION Pocatec Limitée,
C.P. 1390,
85,route 132 ouest,
La Pocatière, Québec.
G0R 1Z0

PRINCIPAL INVESTIGATOR Fernand Landry (administrative);
Michel Bochud (technological).

DURATION 12 Feb. 1981 to 15 Feb. 1982.

SPONSOR Agriculture Canada.

SCIENTIFIC AUTHORITY Dr. Roger Thériault,
Station de recherches,
Agriculture Canada,
430, boul. Gouin,
C.P. 457,
Saint-Jean, Québec.
J3B 6Z8 (514) 346-4494.

OBJECTIVE

The solar dryer had the aim to show whether it was possible to lower the moisture content of horticultural peat by means of solar energy together with forced ventilation.

The project was to have shown that this drying principle is industrially and commercially applicable.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82			$74,660.

DESCRIPTION

A Brace-greenhouse structure collected solar energy and ambiant air was thus heated.

A peat bed approximately 8 cm thick, by 1.8 m wide and 18 m long was placed on a conveyor belt. Forced ventilation made the heated dry air cross the peat bed. An adiabatic reaction occurred and the air lowered in temperature as its moisture content rose. It was thus possible to lower the moisture content of the peat from 75% to 40% which appreciably lowered its weight and consequently the cost of transport.

It has been shown that the majority of the effective drying was not due to solar energy but to ventilation energy. It was thus important to optimise ventilation energy.

STATUS AND COMMENTS

This research permitted a certain number of parameters in solar drying to be identified and, in particular, it showed the main effect of ventilation energy for drying purposes.

REPORTS

A final report, containing drawings of the dryer, was prepared in three copies. A seven page scientific and technical report was prepared for the Symposium: Techniques de conservation de l'énergie, CEGEP La Pocatière, 31 May - 2 June 1982. The final report and the summary are available from the scientific authority, Dr. Roger Thériault.

TITLE A Simultaneous Dewatering and Liquefaction of Peat.

CONTRACT # 31155-9-2666 EP 256 **COST** $42,534.
(1SX79-00123)

ORGANIZATION Sandwell Beak Research Group,
6870 Goreway Drive,
Mississauga, Ontario.
In association with:
Dr. John Hughes,
Plastistarch Corp. Ltd.,
Montréal, Québec. (416) 671-2606.

PRINCIPAL INVESTIGATOR Marc Grandbois.

DURATION 4 months.

SPONSOR Bioenergy Program, N.R.C.

SCIENTIFIC AUTHORITY Dr. R.P. Overend,
Bioenergy Program, Division of Energy R & D
National Research Council,
Ottawa, Ontario.
K1A 0R6 (613) 993-1342.

OBJECTIVE

To establish the feasibility of using the Hughes reactor to dewater peat and to establish optimum conditions so that subsequent liquefaction of the peat will be both efficient and economical, including single step dehydration of peat; characterization of the peat found in southern Canadian bogs and have peat dewatered by the Hughes reactor and; modificauion of the existing Hughes reactor for optimum assessing of biomass and peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1979-80	$32,000.		$32,000.
1980-81	$10,534.		$10,534.

DESCRIPTION

The reactor chosen to maximize mass transfer is the newly developed Hughes reactor in which the slurry is accelerated into a Venturi throat thus accumulating high kinetic energies which should result in colloidal breakdown of the peat material in the decompression zone accompanied by the fractional dewatering of the feedstock.

Based on actual performance of the Hughes reactor, as applied to hydrolysis of starch, it is estimated that the peat dewatering will result in space-time yields of the order of 100 to 500 l. slurry/l. reactor/hr. Also, the over-all thermal efficiency of the process should be higher than 70% based on actual performance of the unit.

Sufficient samples of peat in its natural state will be obtained from a typical well humified bog in Southern Québec. They will be thoroughly macerated and sealed in appropriate drums. Initial screening experiments will test the reactor cold and obtain data on suitable residence times, temperature and pressure ranges. Also, they will serve the purpose of checking the long term operation of the system. A steady state experiment will be defined as having a minimum 2 hour duration under steady state conditions.

The dewatering experiments will investigate the colloidal breakdown as a function of temperature and pressure. Once the reaction is accomplished the material will be collected and filtered following established procedure and a moisture determination will be immediately carried out.

STATUS AND COMMENTS

Completed. The "Hughes reactor" did not perform as expected; no further work using this reactor is anticipated. However, other novel approaches to dewatering were shown to be possible.

REPORTS

Contract Final Report available only on microfiche form CISTI.

A Low Severity Peat Dewatering Technology by E. Chornet, K. Farrell, R.P. Overend and C. Roy. Proc. Int. Peat Symp., Bemidji, Minnesota, USA, Oct. 21-23,81

TITLE Thermal Dewatering of Lignite and Peat.

CONTRACT # 23SQ-23440-9-9164 **COST** $70,635.
(OSQ79-00205)

ORGANIZATION Saskatchewan Power Corporation,
2025 Victoria Avenue,
Regina, Saskatchewan.
S4P 0S1

PRINCIPAL INVESTIGATOR Director of Coal and Gas Research,
(Dr. Adam Szladow) (306) 566-2287.

DURATION 1 April 1978 - ongoing.

SPONSOR Energy Mines and Resources,
Monalta Coal Ltd. and Sask. Power Corp.

SCIENTIFIC AUTHORITY Dr. J. Price,
Energy Research Laboratories,
Energy, Mines and Resources,
c/o 555 Booth Street,
Ottawa, Ontario.
K1A 0G1

OBJECTIVE

1) To compare the amount of dewatering obtained and the amounts of Na, K, and S removed from lignite and peat at different temperatures, residence times and lump sizes.
2) Prepare materials/heat balance between bed-moist and dewatered fuels for selected experiments, including experiments using oil.
3) Compare the physical characteristics of feedstock and selected products - including experiments using oil.
4) Evaluate chemical analyses of feed, products effluent H_2O and gases plus preliminary assessment of the potential environmental impact of commercial dewatering plants.
5) Estimate energy requirements to dewater lignite and peat, optimize design criteria and estimate overall economics.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
	EMR	Sask. Power	
1980-81	$35,317.50	$35,317.50	$70,635.

DESCRIPTION

Major work has been in lignite - not in peat. A proprietary process has been developed for the dewatering of lignite and peat. One patent has been obtained and a second one is being applied for.

70% moisture content is reduced to 10%.

STATUS AND COMMENTS

Saskatchewan Power Corporation is interested in producing more power in the northern part of their grid to balance production of power in the south of the province. They are also interested in the needs of the remote communities but have done more work with wood than with peat.

REPORTS

Reports are available for phases one and two from EMR CANMET. Reports on phases three and four contain proprietary information.

TITLE Upgrading Waste Biomass into Methane Fuel Gas by Anaerobic Fermentation.

CONTRACT # **COST** $60,000.

ORGANIZATION Department of Chemical Engineering,
Waterloo University,
Waterloo, Ontario.
N2L 3G1

PRINCIPAL INVESTIGATOR M. Moo-Young; (519) 885-1211 ext.3919

DURATION 3 years.

SPONSOR Natural Sciences and Engineering Research Council - Strategic Grant.

SCIENTIFIC AUTHORITY Prof. Murray Moo-Young,
Dept. of Chemical Engineering,
University of Waterloo,
Waterloo, Ontario.
N2L 3G1 (519) 885-1211 ext. 3919

OBJECTIVE

In the proposed research, we plan to apply our previously attained expertise in anaerobic digestion in order to develop a free-standing anaerobic fermentation process which will generate fuel gas as the main product. We intend to determine the solids conversion efficiency (litres gas produced/g. solids added) and the concomitant gas generation rate for a range of agricultural and forestry wastes (seperately and in combinations) which are widely available in Canada. The results will be used to perform an engineering analysis of the process energy budget for the various cases and to perform a detailed economic analysis of a number of scenarios pertinent to the types of raw materials available in representative regions of Canada.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82	$22,200.		$22,200.
1982-83	$22,200.		$22,200.
1983-84	$16,200		$16,200.

DESCRIPTION

The work program is divided into four areas:

a) a state-of-the-art review of the relevant literature.

b) design and construction of experimental equipment.

c) experimental studies of co-digestion of manures and cellulosic residues, selected as grass, straw, and corn stover as well as peat.

d) development and application of a computer program for process economic evaluations.

STATUS AND COMMENTS

Working in collaboration with J.M. Scharer and C.W. Robinson. See project #38 for previous work under Strategic Grant 1978-1981.

The evaluations for agricultural wastes (in the form of cattle and swine manures) and crop residues (in the form of corn stovers) are nearing completion and process design criteria are being established. The experimental research on forestry wastes have not yet started. Equipment is now in place to test the potential utilization of forestry residues for biogas production with concurrent pollution abatement of the wastes.

REPORTS

Related publications.

Chahal,D.S., Vlach,D. and Moo-Young,M.,"Effect of physical and physiochemical pretreatments of wood for SCP Production with *C. cellulolyticum*", Biotechnol. Bioeng., In press (Acepted 1981)

Moo-Young,M.,Chahal,D.S. and Stickney,B., "Pollution control of swine manure and straw by conversion to *C. cellulolyticum* SCP feed", Biotechnol. Bioeng., (In Press- accepted Mar. 81)

Moo-Young,M. and Macdonald,D.G.,"Improved economics of the Waterloo SCP process by increased growth rates", Biotechnol. Letters,3,149-152 (1981).

Gonzalez-Valdes,A. and Moo-Young,M., "Production of yeast SCP from corn stover hydrolysates". Biotechnol. Letters,3, 143-148 (1981).

TITLE Conversion of Cellulosic Materials into Animal Feed by Semi-Solid Fermentation.

CONTRACT # **COST**

ORGANIZATION Department of Chemical Engineering,
University of Waterloo,
Waterloo, Ontario.
N2L 3G1 (519) 885-1211 ext. 3919

PRINCIPAL INVESTIGATOR Murray Moo-Young, C.W. Robinson (Waterloo)
J.G. Buchanan-Smith (Guelph)

DURATION 1980-83.

SPONSOR Natural Sciences and Engineering Research Council and others.

SCIENTIFIC AUTHORITY Prof. Murray Moo-Young, et al.,
Dept. of Chemical Engineering,
University of Waterloo,
Waterloo, Ontario.
N2L 3G1 (519) 885-1211 ext. 3919

OBJECTIVE

To further develop a novel fermentation process. Based on the mass microbial cultivation of a new cellulosic fungus, *Chaetomium cellulolyticum* in solid-substrate systems, this process can be used for the bioconversion of agricultural and forestry wastes into proteinaceous feed/food products. Preliminary feeding trials indicate that the SCP (single-celled protein) products are suitably nutritious, digestible and non-toxic in animal feed protein ratios. Economic analyses indicate the process could be operated at a profit for a range of realistic scenarios in both developed and developing countries.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1980-81	NSERC $20,000		$20,000

DESCRIPTION

The Waterloo Process uses a three-stage operation which involves: (a) thermal and/or chemical pretreatment of a cellulosic material, (b) aerobic fermentation of the pretreated cellulosic material with nutrient supplements, (c) separation of the suspended solids (the product) from the fermented broth. The cellulosic material provided the main carbon source for the fermentation. The main non-carbon nutrient supplements (N, P, K, etc.) are derived from commercially-available fertilizer blends or animal manure. If manure is used, it is pretreated by anaerobic fermentation to produce methane fuel gas as a by-product which supplies operating energy.

The cellulosic raw material is pretreated with hot water or dilute alkali (NaOH or NH3), depending on the feedstock type, to reduce the inherent recalcitrance of the solids to fermentation by swelling and/or partial delignification. The basic process is carried out as a solid-substrate fermentation in slurry systems. Depending on the product requirement, a forage grade carbohydrate co-product of unfermented cellulose may also be produced admixed with the main SCP product. The co-product is rendered digestible by the action of the extracellular fungal cellulase enzymes which are generated during the fermentation. Any residual lignin serves as inert diet roughage in the product. Because of the large mycelial growth forms of the fungus, the SCP product can be recovered by relatively simple, inexpensive filtration methods. The effluents of the process are essentially carbon dioxide and BOD-free water.

STATUS AND COMMENTS

REPORTS

Moo-Young, M.; Daugulis, A.J.; Chahal, D.S.; Macdonald, D.G. "The Waterloo Process for SCP Production from Waste Biomass", Process Biochemistry, No. 10, Oct. 1979 pp. 38-40.

TITLE Anaerobic Fermentation of Peat Wet-Oxidation Pressate for the Production of Methane.

CONTRACT # 31926-3-0105 **COST** $44,611.

ORGANIZATION ADI Limited,.
1115 Regent Street,
Frederiction, New Brunswick.

PRINCIPAL INVESTIGATOR Albert Cocci.

DURATION January 1984 to December 1984.

SPONSOR National Research Council,
Environment Canada.

SCIENTIFIC AUTHORITY
J. K. Day,
Environment Canada,
45 Alderney Drive,
Dartmouth, Nova Scotia.
B2Y 2N6 (902) 426-6132

PROJECT MANAGER
T.E. Tibbetts,
N.R.C. Canada,
1411 Oxford Street,
Halifax, N.S.
B3H 3Z1 (902) 426-6132

OBJECTIVE

To investigate the technical and economic feasibility of application of the NRC downflow filter and ADI-BVF biogasification technologies to peat wet oxidation pressate.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	NRC/EC	ADI Ltd.	$15,000.
1984-85	NRC/EC	ADI Ltd.	$30,000.

DESCRIPTION

The study will involve:

- securing and characterizing an adequate supply of wet-ox pressate from fuel grade peat of known type and degree of humification.
- carrying out a bench scale study to demonstrate treatibility using NRC downflow filter and ADI-Bulk Volume Fermenter technologies and assess model performance in terms of COD-/BOD removal as a function of organic loading.
- assessing bench scale results and systems to develop preliminary design criteria.

STATUS AND COMMENTS

- Project on-going using pressate from Ontario Research Foundation's wet-oxidation pilot plant.

REPORTS

By December 1984.

TITLE Development of the Lamb Wet-Cell Burner for Energy from New Brunswick Peat.

CONTRACT # 31926-3-0113 **COST** $248,200

ORGANIZATION Lamb-Cargate Industries Ltd.,
P.O. Box 440,
1135 Queen Avenue,
New Westminster, B.C.
V3C 4Y7

PRINCIPAL INVESTIGATOR Ian Rowe.

DURATION March 1984 to December 1984.

SPONSOR National Research Council Canada,
Supply and Services Canada and
Province of New Brunswick.

SCIENTIFIC AUTHORITY T.E. Tibbetts,
NRC Atlantic Research Laboratory,
1411 Oxford Street,
Halifax, Nova Scotia.
B3H 3Z1 (902) 426-7532

OBJECTIVE

Development of the Lamb wet-cell burner specifically designed to combust unprepared wood and bark waste up to 60% moisture to handle and combust high moisture fuel peat.

FUNDING

Fiscal Year	Sponsor(s)		Total
	NRCC	SSC	
1983-84	$71,000	$50,000	$121,000
	NRCC	NB	
1984-85	$28,000	$99,000	$127,000

DESCRIPTION

The work involves the design and construction of a reduced scale peat burner using the wet-cell design with specific revisions to fuel feed and grates; testing and modification of the pilot unit to derive a firm design basis for a full scale commercial application.

STATUS AND COMMENTS

Positive results have been achieved in the design and test program and scale up of the design parameters is anticipated in a commercial unit.

REPORTS

December 1984

4.6.4

ENVIRONMENT

Reclamation strategies, environmental protection criteria, the ecology of wetlands and studies as to how bogs and fens interact with their environment are being addressed.

TITLE Radiocarbon Dating of 25 Peat Samples

CONTRACT # 05681-00004 **COST** $3,750.00

ORGANIZATION Department of Geological Sciences,
Brock University,
St. Catherines, Ontario.
L2S 3A1

PRINCIPAL INVESTIGATOR Dr. J. Terasmae, (416) 688-5550 ext. 526

DURATION December 1981 - February 1982.

SPONSOR Environment Canada.

SCIENTIFIC AUTHORITY Dr. S.C. Zoltai,
Northern Forest Research Centre,
Environment Canada,
5320 - 122nd Street,
Edmonton, Alberta.
T6H 3S5 (403) 435-7210

OBJECTIVE

1) To determine age of volcanic ash marker horizons;
2) To determine age of abrupt changes from fen to bog conditions;
3) To determine the beginning of peat deposition.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82	3,750		3,750.00

DESCRIPTION

25 peat samples collected in Alberta were tested: some as peat boundaries, others to determine age of volcanic layers to be used as stratigraphic markers.

TITLE Radiocarbon Dating of 20 Peat Samples

CONTRACT # 05682-00073 **COST** $3,000.00

ORGANIZATION Department of Geological Sciences,
Brock University,
St. Catherines, Ontario.
L2S 3A1

PRINCIPAL INVESTIGATOR Dr. J. Terasmae, (416) 688-5550 ext. 526

DURATION November 1982 - February 1983.

SPONSOR Environment Canada.

SCIENTIFIC AUTHORITY Dr. S.C. Zoltai,
Northern Forest Research Centre,
Environment Canada,
5320 - 122nd Street,
Edmonton, Alberta.
T6H 3S5 (403) 435-7210

OBJECTIVE

To determine the age of 20 peat samples from various locations in central Manitoba between latitude 53 o and 54 degrees North, and from depths of 50 to 300 cm.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	3,000		3,000.00

DESCRIPTION

All samples were expected to be less than 5,000 years old, with the exception of three which were in the range of 5000-8000. This was the case.

TITLE Radiocarbon Dating of 10 Peat Samples

CONTRACT # **COST** $1,500.00

ORGANIZATION Department of Geological Sciences,
Brock University,
St. Catherines, Ontario.
L2S 3A1

PRINCIPAL INVESTIGATOR Dr. J. Terasmae, (416) 688-5550 ext. 526

DURATION November 1982 - March 1983.

SPONSOR Federal Government - Peat Forum, LRRI

SCIENTIFIC AUTHORITY Dr. Charles Tarnocai,
Land Resource Research Institute,
Agriculture Canada,
CEF, Ottawa, Ontario,.
K1A 0C6 (613) 995-5011

OBJECTIVE

To determine the age of Basal Peat samples and some accumulation rates.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	1,500.00		1,500.00

STATUS AND COMMENTS

Results available from Charles Tarnocai:
samples # 83-1-5-1- 83-1-4-1-
83-1-4-3- 83-82-1-16-
Location of sample source not supplied to Radiocarbon Laboratory.

TITLE Radiocarbon Dating of 3 Peat Samples

CONTRACT # **COST**

ORGANIZATION Department of Geological Sciences,
Brock University,
St. Catherines, Ontario.
L2S 3A1

PRINCIPAL INVESTIGATOR Dr. J. Terasmae, (416) 688-5550 ext. 526

DURATION September 1983.

SPONSOR Environment Canada

SCIENTIFIC AUTHORITY J.Coakley,
Canada Centre for Inland Waters,
867 Lakeshore Road,
Burlington, Ontario.
L7R 4A6

OBJECTIVE

The determination of the age of three stratigraphic units of a single core taken through organic deposits and alluvial sediments. The sample site was north of Clear Creek, Lake Erie shoreline, Ontario.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Hand augered borehole through organic sediments and alluvial deposits. Core segments radiocarbon dated were taken from the 135-150 cm, 166-180 cm, and the 235-253 cm intervals.

REPORTS

Chronology and Significance of a Holocene Sedimentary Profile from Clear Creek, Lake Erie Shoreline, Ontario.
Barnett,P.J., Coakley,J.P., Terasmae,J. and Winn,C.E.

TITLE Radiocarbon Dating of Peat Samples

ORGANIZATION Department of Geological Sciences,
Brock University,
St. Catherines, Ontario.
L2S 3A1

PRINCIPAL INVESTIGATOR Dr. J. Terasmae, (416) 688-5550 ext. 526

DURATION 1984-85

SPONSOR Dept. of Land Resource Science, U. of Guelph.

SCIENTIFIC AUTHORITY Dr. Richard Protz,
Department of Land Resource Science,
University of Guelph,
Guelph, Ontario.
N1G 2W1

OBJECTIVE

To determine shoreline positions and rate of uplift in Hudson Bay area.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

The Carbon 14 analysis of peat samples from the top and bottom of peat horizons was used to establish uplift rates and shoreline positions in the study area.

REPORTS

Protz, R., Ross, G.J., Martini, I.P. and Terasmae, J. 1984. Rate of Podzolic soil formation near Hudson Bay, Ontario. Canadian Journal of Soil Science 64: 31-49.

4.6.4 ENVIRONMENT JAC 28/8/84

TITLE Development of Environmental Protection Criteria and Technologies Applicable to Peat Extraction, Processing, Combustion or Conversion Processes.

CONTRACT # **COST** $805,000. (est.)

ORGANIZATION

Environment Canada,
Environmental Protection Service,
Place Vincent Massey,
351 St. Joseph Blvd.,
Hull, Québec. K1A 1C8

National Water Research Inst.,
Box 5050, C.C.I.W.,
Burlington, Ontario. L7R 4A6

EPS Atlantic Region,
45 Alderney Drive,
Dartmouth, N. S. B2Y 2N6

PRINCIPAL INVESTIGATORS

- M. Guilcher and J.K. Day,
  EPS Atlantic Region (902) 426-6132
- W. Glooschenko,
  N.W.R.I./C.C.I.W. (416) 637-4229

DURATION 1982-1987

SPONSOR Panel for Energy R & D (P.E.R.D.) 92.5%

SCIENTIFIC AUTHORITIES

- W.B. Blakeman, Mining Div.
  EPS, Hull (819) 997-2270
- J.K. Day and M.P. Guilcher,
  EPS Atlantic Region, (902) 426-6132
- E. Hall,
  EPS, Burlington (416) 637-4715

OBJECTIVE

The overall objectives of the Environment Canada Research Program are to develop pollution control criteria and to identify abatement technologies which will ensure that surface and ground water systems and air quality are not damaged through release of pollutants from facilities which would harvest, process or utilize peat for the production of energy.

83/84 Objectives:
1) Publication of 3 reports started in FY 82/83.
2) Characterization of waste liquids from bench scale low severity peat benefication processes. (O.R.F.)
3) Investigation of Biological Treatability of waste waters from wet oxidation of peat. (ADI Ltd.)
4) Initiation of investigation of bog draining and wet harvesting and process water discharges on surface water quality. (E.C.S./N.W.R.I.)

FUNDING

Fiscal Year	Sponsor	Contractor	Total
	P.E.R.D.	Environment Canada	
82/83	90,000.	15,000 (est.)	105,000.
83/84	155,000.	15,000 (est.)	170,000.
84/85	325,000.	15,000 (est.)	340,000.
85/86	175,000.	15,000 (est.)	190,000.

DESCRIPTION

The EPS Program has four phases:

Phase

1) Identification and determination of the potential for the release of pollutants to the aquatic environment from harvesting and pre-utilization processing of the peat resource.

1A Literature searches.
(FY 81/82 Completed)

1B Sampling & Analysis of 3 Candidate Bogs.
(FY 82/83 Completed)

1C Identification & Characterization of potential contaminants in effluents from peat dewatering processes.
(FY 83/84 Completed)

2) Identification of Appropriate Water Pollution Control technology for extraction and pre-utilization processing as required.

2A Literature searches.
(FY 82/83 Completed)

2B Bench scale testing as required.
(FY 83/84 Initiated)

3) Determination of water and air pollution potential of peat combustion, liquefacation or gasification.

3A Literature searches.
(FY 82/83 Completed)

3B Burning Tests.
(FY 84/85 see #)

3C Analyses (ash, particulates and gaseous emissions)
(FY 85/86 see #)

4) Identification of appropriate pollution abatement technologies applicable to peat combustion or conversion.

4A Bench scale testing as required.
(FY 86/87 see #)

# Timing of individual sub-phases following 3-A is tentative and contingent upon the results of the proceeding phases as well as on the timing of EMR/electric utility combustion/conversion test programs.

The E.C.S./N.W.R.I. Program includes identifying downstream water quality effects of peat harvesting.
(FY 83/84 Initiated)

STATUS AND COMMENTS

All 1983/84 objectives achieved - in addition:

1) Research was initiated into as anaerobic treatment/ ammonia recovery process for wet ox waste waters (O.R.F.)
2) Program contributed to a project to sample and analyse wood smoke for comparison with emissions from peat fueled sources in FY 84/85. (SENES)
3) E.P.S. participated in contract review of Fereral, Provincial and European Peat R & D policies. (J.P. Nicholson)
4) E.P.S. participated in research to develop a modelling technique to identify environmental impacts of various peat bog dewatering and peat harvesting activities. (NRC/IEC-BEAK).

REPORTS

Survey of Literature on the Assessment of the Pollution of the Peat Resources, contractor report to Peat Forum, summer 1982. (Washburn and Gillis)

Publications/Reports in 83/84 or in press:

1) Identification of the Pollution Potential of the Harvesting And Pre-Utilization Processing of Peat as an Energy Commodity. (Washburn and Gillis)
2) Identification of the Pollution Potential of Peat Combustion, Liquefaction and Gasification. (Monenco)
3) Evaluation of Data from 1982 Sampling Program of Potential Pollutants in Water and Peat Samples from Three Peat Bogs in Canada. (Washburn and Gillis)

All of above reports published in NRC Peat/Energy Series.

TITLE Wastewater Characteristics of Five Peat Dewatering Processes

CONTRACT # 07SC KEZ05-3-P063 **COST** $51,000
OSC 83 00442

ORGANIZATION Ontario Research Foundation,
Sheridan Park Research Community,
Mississauga, Ontario.
L5K 1B3

PRINCIPAL INVESTIGATOR D.K. Smith, Matthew P. McKim, J. Lindsay
(416) 822-4111

DURATION 12 months

SPONSOR Peat Forum, Environment Canada

SCIENTIFIC AUTHORITY Ms. K. (Sue) Day,
EPS Atlantic Region,
Environment Canada,
3rd Floor, Queen Square,
45 Alderney Drive,
Dartmouth, Nova Scotia.
B2Y 2N6 (902) 426-6132

OBJECTIVE

To characterize wastewaters discharged from five peat dewatering processes currently being investigated: wet carbonization, wet oxidization, low severity thermal dewatering, biological polymer enhancement of dewatering and mechanical pressing.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	51,000		51,000

DESCRIPTION

The exploitation of Canada's vast peat reserves through wet mining and subsequent dewatering to produce a peat-derived fuel has received increasing interest. Five dewatering technologies are being investigated as possible elements in the production of peat-derived fuel. Three processes are based on thermal pretreatment of the peat, viz. wet oxidation by the Ontario Research Foundation, wet carbonization by the Institute of Gas Technology and the "low-severity" process of L' Université de Sherbrooke. The two non-thermal processes are the McGill University's dewatering using microbial products and the rotary press developed by Le Centre de Recherche du Québec. As peat contains up to 90% moisture, the dewatering of peat results in the discharge of copius wastewater. The principal objective of this work was to characterize these effluents.
The chemical and biological characteristics of the wastewaters discharged by the five dewatering processes varied greatly amongst each other. The wet oxidation and wet carbonization produced strongly coloured effluents with high levels of biological demand, ammonium and phenolic compounds. Some acid extractable priority pollutants and toxic heavy metals were detected in these effluents, but not at alarming levels. Each of the three thermal processes were reported to have a high toxicity. However, they are likely amenable to biological wastewater treatment.
The two non-thermal processes were found to be non-toxic. The CRIQ pressate was heavily laden with suspended solids and strongly coloured. The filtrate provided by McGill University was very low in all pollutant parameters measured, including colour.

STATUS AND COMMENTS

Work is complete and a report prepared. Analytical data indicates that chemical and biological characteristics of the wastewaters discharged by the dewatering processes varied greatly. The wet oxidation and wet carbonization produced coloured effluents with high levels of BOD, ammonium and phenolic compounds. As noted above, the non-thermal process effluents were less coloured and lower in measured pollutant parameters.

REPORTS

Wastewater Characteristics of Five Peat Dewatering Processes. To be published under the National Research Council, Energy R&D Division, "Peat for Energy" series, available: fall 1984.

4.6.4 ENVIRONMENT JAC 28/8/84

TITLE Impact of Peat as an Energy Source Upon Aquatic Ecosystems.

CONTRACT # **COST**

ORGANIZATION Ecological Impact Section,
Aquatic Ecology Division,
National Water Research Institute,
Box 5050,
Burlington, Ontario.
L7R 4A6

PRINCIPAL INVESTIGATOR W. Glooschenko / R. Bourbonniere.

DURATION Three years beginning 1984.

SPONSOR N/A

SCIENTIFIC AUTHORITY N/A

OBJECTIVE

The large scale use of peat for energy production has a potential impact upon nearby lakes and streams. The study will enable us to predict the impact of peat mining upon aquatic ecosystems and increase our knowledge of natural acidification processes.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984/85			$96.5K
1985/86			$85.0K (est)
1986/87			$70.0K (est)

DESCRIPTION

The Study will have four main purposes:

1) To assist DOE in developing policies on peatland utilization for energy production and its environmental impact on aquatic ecosystems.

2) To improve understanding of the environmental impact of peatland drainage and exploitation upon adjacent streams and lakes. To prepare a literature review on this topic.

3) To review use of indicator species of peatland biota (algae, invertebrates) that can be used to trace drainage impact from peatlands into nearby lakes and streams.

4) To characterize the chemical composition, both organic and inorganic, of water and peat from peatlands and peatland outflow. Specific chemicals to include hydrophobic and hydrophilic organics, lipids, and humic acids. Inorganics to include sulfur, acids and trace metals.

The main study site will be a bog located at Barrington, N. S. which is slated for drainage and peat extraction for energy production. Other minor sites will be Luther bog in southern Ontario and some bogs in northern Ontario.

STATUS AND COMMENTS

Intensive field sampling has begun in July 1984 which will continue through 1985. Chemical and biological analyses have started in the laboratory.

REPORTS

Preliminary report estimated for March 1985.

TITLE Determination of Trace Contaminants in Peat Water

CONTRACT # 03SU KE145-2-0658 **COST** $19,390.00

ORGANIZATION Department of Civil Engineering,
University Of British Columbia,
Vancouver, British Columbia.

PRINCIPAL INVESTIGATOR Dr. J.W. Atwater,

DURATION 6 months

SPONSOR Peat Forum, Environment Canada

SCIENTIFIC AUTHORITY Mike P. Guilcher,
EPS Atlantic Canada,
Environment Canada,
3rd Floor, Queen's Square,
45 Alderney Drive,
Dartmouth, Nova Scotia.
B2Y 2N6 (902) 426-6132

OBJECTIVE

To analyze samples of peat waters collected at three Canadian sites:
- St. Shott's, Newfoundland;
- Galbraith Bog, Ontario,
- Burn's Bog (Fisons Western), British Columbia.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	19,390		19,390.00

DESCRIPTION

A monitoring program was developed to assess the potential for water pollution at peat harvesting operations in Canada: a sod peat harvesting operation (St. Shott's), a hydraulic mining operation (Burn's Bog), and a bog ditched in preparation for drawing (Galbraith Bog). Sampling sites were designated and organic/inorganic analyses conducted on liquid samples.

STATUS AND COMMENTS

Work complete. Data is incorporated as part of a report on the entire monitoring program.

REPORTS

Evaluation of Data from 1982 Sampling Program of Potential Pollutants in Water and Peat Samples from Three bogs in Canada. Published by the National Research Council, Division of Energy R&D, under the auspices of the Peat Forum - "Peat Energy Series".

TITLE Prepare the Second Edition of "An Evaluation System for Wetlands of Ontario South of the Precambrian Shield".

CONTRACT # KR405-3-0279 **COST** $6300.

ORGANIZATION (private contractor)
40 Rossland Avenue,
Nepean, Ontario. K2G 2K4

PRINCIPAL INVESTIGATOR E. Bottomley

DURATION 1 Dec. 1983 to 29 Feb. 1984

SPONSOR Environment Canada

SCIENTIFIC AUTHORITY Mr. J.F. Carreiro,
Environment Canada,
Canadian Wildlife Service,
Ontario Region,
1725 Woodward Drive,
Ottawa, Ontario K1A 0E7 (613) 998-4693

OBJECTIVE

Wetlands - bogs, fens, swamps and marshes - are a valuable resource in Southern Ontario. Environment Canada and the Ontario Ministry of Natural Resources produced a system for evaluating wetlands in Ontario for the purpose of measuring relative values of wetlands. It is intended for use at various levels in Ontario's planning process. Wetland values are assessed under four component groupings: biological, social, hydrological and special features. Each component is scored out of a maximum possible 250 points. Extensive field testing in summer 1983 identified various parts of the evaluation system which required clarification or modification. The Canadian Wildlife Service requires the preparation of a Second Edition of "An Evaluation System for Wetlands of Ontario South of the Precambrian Shield (1983)" to incorporate these modifications.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	$6300.		$6300

DESCRIPTION

The Second Edition of the evaluation system will incorporate changes to:

a) improve organization and general layout of the manual ;

b) clarify definitions and concepts;

c) edit the text and diagrams;

d) improve consistency;

e) include suggestions made by agencies involved with testing the system (Minintry of Natural Resources, Conservation Authorities, Canadian Wildlife Service);

f) make the technique for vegetation mapping consistent with techniques used in the Ontario Geological Survey's Peatland Inventory Project.

LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL

REPORTS

"An Evaluation System for Wetlands of Ontario South of the Precambrian Shield, Second Edition" was printed in March 1984.

(The first edition -1983- of the evaluation system was developed using a report prepared by Ecologistics Ltd. in 1981 entitled "A Wetland Evaluation System for Southern Ontario").

TITLE Slave Lake Wetland Improvement Project.

CONTRACT # **COST** $582,000. (est.)

ORGANIZATION Department of Geology,
University of Alberta,
Edmonton, Alberta.
T6G 2J9

PRINCIPAL INVESTIGATOR Dr. J. Toth, Hydrologist;
(403) 432-5211.

DURATION Spring 1981 to 1986.

SPONSOR Alberta Provincial Government.

SCIENTIFIC AUTHORITY Joe Soos,
Forest Research Branch,
Alberta Dept. of Energy and Natural Resources,
Postal Bag 6343,
Spruce Grove, Alberta.
TOE 2CO (403) 962-8700.

OBJECTIVE

To study the effects of drainage of peatland on quality and quantity of water yield. Effects of drainage will be measured hydrologically as well as ecologically.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82	$50,000.		$50,000.
1982-83	$70,000.		$70,000.
1983-84	$125,000.		$125,000.
1984-85	$128,000.		$128,000.
1985-86	$109,000.		$109,000.

DESCRIPTION

Forest Research Branch of Alberta Forest Service made observations that increased wood production resulted along ditches when watertable was lowered. On the basis of this experience, decision was made to set up research program of similar project. The site selected near Slave Lake has had stream flow guaged for a number of years. In summer 1981, contour map was made of site, peat depths measured, observation holes bored with water level and quantity tested regularly. Plans are in progress to be completed by October 1981 for record of drainage outflow and hydrological/ecological effects.

STATUS AND COMMENTS

A system of surface drains was designed, licensed and constructed during the winter of 1983/84. Drainage commenced in the spring of 1984 and forest research plots were laid out during the summer field season. Annual measurement of growth increments and analysis of their magnitude will be made annually. Surface and groundwater supply and quality studies will continue as well.

REPORTS

TITLE Report on Existing Information Sources-Wetland Conversion in Canada.

CONTRACT # KN107-1-4669 **COST**

ORGANIZATION

PRINCIPAL INVESTIGATOR Pauline Lynch-Stewart; private consultant.

DURATION 1981-82.

SPONSOR Environment Canada.

SCIENTIFIC AUTHORITY Jennifer Moore and Clayton Rubec,
Environmental Conservation,
Lands Directorate,
Environment Canada,
Ottawa, Ontario.
K1A 0E7 (819) 997-2320.

OBJECTIVE

The Conversion of wetland areas to agricultural, urban, transportation and other uses is of national significance in Southern Canada. This project is intended to assess and evaluate national trends in the change of land use associated with wetlands, from existing information sources. The study is to provide a basis for the development of the Wetland Project of the Canada Land Use Monitoring Program (CLUMP).

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Surveys were sent out to research agencies and organizations across Canada requesting information on research or activities (completed, current or planned) related to:

a) land use change on or adjacent to wetlands - particularly those significant to an assessment of the rate and extent of wetland conversion in Canada;

b) wetland evaluation and/or inventory;

c) wetland areas considered to be of national significance warranting the attention of a monitoring program.

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STATUS AND COMMENTS

Completed.

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REPORTS

Land Use Change on Wetlands in Southern Canada: Review and Bibliography (1982) Lands Directorate W.P. #26 Author: P. Lynch-Stewart.

TITLE Impacts on Wetlands by the Proposed International Lake Erie Regulations.

CONTRACT # 02SZ.KL108-8-0159 **COST** &2,750.00

ORGANIZATION Elizabeth Snell,
RR 1,
Cambridge, Ontario.
N1R 5S2

PRINCIPAL INVESTIGATOR Ms. Elizabeth Snell; (519) 623-0755.

DURATION 6 July 1978 to 1 December 1978.

SPONSOR Environment Canada.

SCIENTIFIC AUTHORITY Mr. James Hodges,
Biologist,
Canadian Wildlife Service,
1725 Woodward Drive,
Ottawa, Ontario.
K1G 3Z7 (613) 998-4693.

OBJECTIVE

Perform a biological and physical inventory of environmental components from a contour line 2 metres above the high water line to that of 3 meters below.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1978-79	$2,750.		$2,750.

DESCRIPTION

The inventory was to include:
- water levels, fluctuations, and effects of changes;
- vegetational community analysis and maps;
- total vegetational species lists;
- review of wildlife species, present and potential;
- soils and water sample collections and field analyses.

The Canadian Wildlife Service also provided the contractor with:
1) General Equipment: 2 sets of 1:50,000 topographic map base maps at the inventory scales, stereo pairs of the most recent aerial photographs, sampling equipment, field working space;
2) Laboratory analyses of collected soil and water samples;
3) Water transportation to the selected wetlands;
4) Contour mapping of the study wetlands at a scale comparable to the inventory scale.

STATUS AND COMMENTS

REPORTS

Environment Survey of Big Island Marsh, Gravelly Bay Marsh and Nut Island Club March.
by Snell, E. and G. Donaldson.

TITLE Wetland Area Distribution and Loss is Southern Ontario.

CONTRACT # KN 107-4-4297; only part of this contract is included in this work.

COST $8040 for that part of contract relating to this project.

ORGANIZATION Elizabeth Snell,
RR 1,
Cambridge, Ontario.
N1R 5S2

PRINCIPAL INVESTIGATOR Elizabeth Snell (519) 623-0755.

DURATION August 1984 to December 1984.

SPONSOR Lands Directorate, Environment Canada.

SCIENTIFIC AUTHORITY Paul Rump,
Chief, Canada Land Use Monitoring Project,
Lands Directorate,
Environment Canada,
Place Vincent Massey, 20th Floor,
Ottawa, Ontario,
K1A 0E7 (819) 997-2240

OBJECTIVE

Report on:
- the approach to the mapping and its development;
- the current status of wetlands in Southern Ontario; the amount and distribution of remaining wetlands, of losses over 2 centuries, of recent losses and of the land use changes that are threatening wetlands.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984-85	8,040		8,040

DESCRIPTION

Overlaid existing maps of wet soils with existing maps of natural land use (as opposed to cropland or urban land etc.) Where these conditions coincided, it was assumed to represent a wetland. Results were presented on 1:50,000 National Topographic Series map sheets. Losses of wetlands were estimated by difference of total wet soil area and wetlands as mapped above.

- the areas of long term losses, recent losses and remaining wetlands were calculated by township, county, and conservation authorities;

- the report will include:

    a) literature review of wetalnd map and loss data in Southern Ontario;

    b) identification of knowledge gaps;

    c) discussion of alternative means of filling gaps;

    d) outline of research methodology and discussion of its development;

    e) presentation of the results - amount and distribution: of remaining wetlands, of losses over 2 centuries, of recent losses over 15 years and of recent land use changes that are threatening wetlands;

    f) conclusions including implications of results to federal actions.

STATUS AND COMMENTS

Report in progress.

REPORTS

To be published in Lands Directorate Working Papers Series in 1985; possible title: "Wetland Area, Distribution and Loss in Southern Ontario".

TITLE Landform Classification and Vegetation - Soil Relations of Southern Ontario Wetlands.

CONTRACT # **COST**

ORGANIZATION Centre for Resources Development,
University of Guelph,
Guelph, Ontario.

PRINCIPAL INVESTIGATOR Elizabeth Snell,
R.R. 1,
Cambridge, Ontario.
N1R 5S2 (519) 623-0755.

DURATION 1974 to 1976.

SPONSOR Natural Research Council of Canada.

SCIENTIFIC AUTHORITY Dr. Douglas W. Hoffman,
Director, Centre for Resources Development,
University of Guelph,
Guelph, Ontario.

OBJECTIVE

To develop a landform classification system easy to use and of assistance to wetland planning decisions.

To study interrelationships of various vegetation and organic soil parameters.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

- a variety of wetlands across southern Ontario were visited and surveyed for landform, soil and vegetation properties.

- a 4 level landform classification was developed using 3 topographic setting classes, 3 lake classes, 6 river classes and 2 substratum classes.

- the classification led to 4 hydrologic types of wetland.

- in 2 case studies, comparison of the classification results to those after detailed study showed close correspondence.

- soil fiber content, while correlating relatively little with other soil properties, correlated well with vegetation communities.

STATUS AND COMMENTS

REPORTS

Landform Classification and Vegetation Soil Relationships of Southern Ontario Wetlands.
M. Sc. Thesis, University of Guelph, May 1976.

TITLE Advanced Treatment of Peat Wastewaters.

CONTRACT # ISE83 - 00368 **COST** $80,200.

ORGANIZATION Ontario Research Foundation,
Sheridan Park Research Community,
Mississauga, Ontario.
L5K 1B3 (416) 822-4111.

PRINCIPAL INVESTIGATOR Matthew P. McKim, P. Eng.

DURATION 1 year.

SPONSOR Environment Canada/DSS.

SCIENTIFIC AUTHORITY Dr. Eric Hall,
Wastewater Technology Centre,
Department of Environment,
867 Lakeshore Road,
P.O. Box 5050,
Burlington, Ontario.
L7R 4A6 (416) 637-4715.

OBJECTIVE

The overall objective of the programme is:
- to develop an anaerobic digestion approach to the treatment of wastewaters resulting from the thermal processing and dewatering of fuel grade peat.

The specific objective of the experimental programme is:
- to examine the efficiency of a novel approach to the removal of BOD5, colour and ammonia by an integrated process entailing anaerobic digestion, activated carbon adsorption and ammonia stripping.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984/85	$80,200.		$80,200.

DESCRIPTION

A novel process has been developed to address the soluble organic material, ammonia and high colour content of wet oxidized peat pressate. The process combines thermophilic anaerobic digestion in an expanded bed reactor, granular activated carbon (GAC) adsorption (GAC also serves as the support media for the expanded bed), and ammonia stripping. The process takes advantage of the acid content and high temperature of the pressate to effect its treatment with a minimum of energy and material inputs. Three options for ammonia removal are to be evaluated in the process, viz. stripping of anaerobically treated effluent, separate stripping of anaerobic reactor liquor, which is being recycled to the reactor, and stripping within the digester using methane evolved from the process.

The proposed work includes piloting of the process described above and its technical and economic evaluation.

STATUS AND COMMENTS

Project just started.

REPORTS

No published reports yet available.

TITLE Pollution Potential of Peat Combustion, Liquefaction and Gasification.

CONTRACT # OS C82 - 00377 **COST** $22,903.00

ORGANIZATION Monenco Limited,
155 Rexdale Blvd.,
Rexdale, Ontario.
M9W 5Z8

PRINCIPAL INVESTIGATOR K. Phinney.

DURATION 3 Months.

SPONSOR Peat Forum through Environment Canada.

SCIENTIFIC AUTHORITY Mike P. Guilcher,
EPS Atlantic,
Environment Canada,
45 Alderney Drive,
Dartmouth, Nova Scotia.
B2Y 2N6 (902) 426-6132

OBJECTIVE

To assess the literature on chemistry of discharges/emissions from peat combustion, liquefaction or gasification and appropriate abatement technology to mitigate adverse environmental impacts associated with these processes; list the relevant references, provide an interprepation of available information as it applies to the Canadian situation; identify data gaps.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	Environment Canada	Monenco Limited	$22,903.00

DESCRIPTION

The report considers the pollution potential associated with processes for the combustion and conversion of peat into liquid and gaseous fuels. Limited information is available in the literature concerning the pollution potential of these processes.

The use of and technology for combustion of peat is highly developed. This allowed for a quantitative assessment of the pollution potential of peat combustion processes. Current and developing pollution control practices for coal and oil fuelled plants should be directly applicable to peat fuelled systems. Technology for the conversion of peat into liquid and gaseous fuels is at an early stage of development. Consequently, little information is available concerning the pollution potential of these processes. The available information, and information for coal conversion processes has been used to provide a quantitative assessment of the pollution potential of peat conversion processes.

STATUS AND COMMENTS

Complete.

REPORTS

Pollution Potential of Peat Combustion, Liquefaction and Gasification.

Published by the National Research Council under the auspics of the Peat Forum.

Peat/Energy Series

NRCC 22859.

TITLE Data Evaluation on Peat/Peat Water Analyses.

CONTRACT # OBSC KE202-2-P075 **COST** $4,986.76

ORGANIZATION Washburn & Gillis Associates Ltd.,
70 York Street,
Fredericton, New Brunswick.

PRINCIPAL INVESTIGATOR Owen Washburn; (506) 454-0213.

DURATION 6 months.

SPONSOR Federal Peat Forum, Environment Canada.

SCIENTIFIC AUTHORITY Mike P. Guilcher,
EPS Atlantic,
Environment Canada,
45 Alderney Drive,
Dartmouth, Nova Scotia.
B2Y 2N6 (902) 426-6132

OBJECTIVE

To evaluate data from a monitoring program conducted at three peat bogs in Canada.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	4,986.46		4,986.46

DESCRIPTION

Samples of peat and bog waters were collected at three sites in Canada:

- sod peat harvesting operation in St. Shott's, Newfoundland.
- Galbraith Bog, Ontario; a bog recently ditched to promote draining a 60 ha plot which is planned to be used as a source of fuel peat.
- Fisons Western Corporation (Burn's) bog in British Columbia, a horticultural peat production operation utilizing hydraulic mining techniques.

Samples were analyzed for heavy metals, convantional water quality parameters and organics. Concentrations in liquid samples were compared to published water quality guidelines and in peat samples to levels in conventional fuels.

STATUS AND COMMENTS

Work completed and report published.

REPORTS

Evaluation of Data from 1982 Sampling Program of Potential Pollutants in Water and Peat Samples from Three Peat Bogs in Canada. Published by the National Research Council, Division of Energy R&D, under the auspices of the Peat Forum, "Peat Energy Series." Contact Peat Program Manager, Ted Tibbetts.

TITLE Identification of the Pollution Potential of the Harvesting and Pre-utilization Processing of of Peat as our Energy Commodity.

CONTRACT # **COST**

ORGANIZATION Washburn & Gillis Associates Ltd.,
70 York Street,
Fredericton, New Brunswick.

PRINCIPAL INVESTIGATOR Owen V. Washburn; (506) 454-0213
Claire Kent.

DURATION 3 months.

SPONSOR Federal Peat Forum, Environment Canada.

SCIENTIFIC AUTHORITY Mike P. Guilcher,
EPS Atlantic,
Environment Canada,
45 Alderney Drive,
Dartmouth, Nova Scotia.
B2Y 2N6 (902) 426-6132

OBJECTIVE

To conduct a literature revies on existing information on the effluent treatment technology associated with peat extraction and pre-utilization processes, list the relevant references, provide an interpretation of available information as it relates to the Canadian situation and identify data gaps.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	Environment Canada	Washburn & Gillis Assoc.	$14,959.16

DESCRIPTION

The literature was reviewed to identify sources of environmental impacts resulting from mining and pre-utilization of fuel peat in Canada and to identify possible methods to mitigate these impacts. Much of the information available from the literature applies to non-fuel uses of peat and is presented in a general manner because details are site specific.

Dry mining may result in increased levels of particulates and acidity. Conventional wastewater treatment is available to mitigate these impacts. Impacts of hydraulic mining differ and are dependent on the dewatering method. Information on waste streams from dewatering schemes is based on small scale rather than production operations.

STATUS AND COMMENTS

Work completed and report published.

REPORTS

Identification of Pollution Potential of the Harvesting and Pre-Utilization Processing of Peat as our Energy Commodity. Published by the National Research Council under the auspices of the Peat Forum "Peat for Energy Series", NRCC 22858.

TITLE Geochemistry of organo-metallic complexes in naturally-acidic waters from peatlands.

CONTRACT # 0ISE.KW405-4-0650 **COST** $7,890.00

ORGANIZATION National Water Research Institute,
867 Lakeshore Road,
P.O. Box 5050,
Burlington, Ontario. L7R 4A6

PRINCIPAL INVESTIGATOR William Shotyk,
Geology Department,
University of Western Ontario,
London, Ontario. N6A 5B7

DURATION 4 months.

SPONSOR National Water Research Institute.

SCIENTIFIC AUTHORITY Dr. W.A. Glooschenko,
Aquatic Ecology Division,
National Water Research Institute,
867 Lakeshore Road,
P.O. Box 5050,
Burlington, Ontario. L7R 4A6

OBJECTIVE

Chemical characterization of waters from Barrington Bog, N. S. and Luther Bog, Ontario:
1) identify small molecular weight organic compounds and determine concentrations of Cu, Mn, Pb, Sn, Al, Hg, and anions e.g. SO_4^{2-}, Cl^-, NO_3^- etc.
2) analyze bog gases for CO_2, CH_4, H_2S, H_2 etc.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984			$7,890.

STATUS AND COMMENTS In progress.

4.6.4 ENVIRONMENT JAC 28/8/84

TITLE Characterization of Organic Waters, Peat and Related Materials.

CONTRACT # 01SE.KW405-4-0644 **COST** $24,450.

ORGANIZATION National Water Research Institute,
867 Lakeshore Road,
P.O. Box 5050,
Burlington, Ontario.
L7R 4A6

PRINCIPAL INVESTIGATOR Brenda L. VanSickle,
(135 Wesley Avenue, Dundas, Ont. L9H 5S7)

DURATION 10.5 months.

SPONSOR National Water Research Institute.

SCIENTIFIC AUTHORITY Dr. R.A. Bourbonniere,
Aquatic Ecology Division,
National Water Research Institute,
867 Lakeshore Road,
P.O. Box 5050,
Burlington, Ontario.
L7R 4A6

OBJECTIVE

Fractionate dissolved organic matter from bog drainage water into six hydrophobic and hydrophilic fractions. Characterize these fractions by potentiometric and chromatographic methods. Extract and characterize unbound and bound biochemical markers from bog plants and stream sediment along the drainage pathway.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984			$22,560.
1985			$ 1,890.

STATUS AND COMMENTS

Field collections and laboratory work in progress.

REPORTS

Progress reports submitted to Scientific Authority throughout duration of contract.

TITLE Le soulèvement des tourbières sur les réservoirs du Complexe La Grande, Territoire de la Baie James, Québec. (The Upthrust of Peat on the Complexe La Grande Reservoirs, James Bay Territory, Québec)

CONTRACT # **COST**

ORGANIZATION Le Groupe Dryade,
642 boul. St-Cyrille ouest,
Québec, Québec.
G1S 1S8

PRINCIPAL INVESTIGATOR Jacques Ouzilleau; (418) 681-0687
Pierre Grondin; Jacques Michaud.

DURATION August to November 1984.

SPONSOR James Bay Energy Society
(Société d'énergie de la Baie James).

SCIENTIFIC AUTHORITY Onil Faucher - S.E.B.J.
Direction de l'Ingénierie et de l'Environnement,
800 boul. de Maisonneuve est,
Montréal, Québec.
H2L 4M8

OBJECTIVE

Evaluate the present importance of the phenomenon of floating peat on the Complexe La Grande reservoirs by way of hypotheses made in 1977 and 1978.

Deduce a model capable of summarizing the phenomenon and able to predict how long it will last.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Carry out photo-interpretation and basic inventory of peat floating on various reservoirs of Complexe La Grande, LG2, LG3,LG4, Opinaca and Caniapiscau. Specify common traits of the peat on Opinaca reservoir. Develop a mathematical model relating botanic constituents of the peat, their degree of decomposition, hydrostatic pressure and speed of flooding in order to be able to explain and predict the upthrust of the peat as well as how long it will last.

STATUS AND COMMENTS

In progress.

REPORTS

Due December 1984

TITLE Gestion des eaux et fertilisation du sol dans une tourbière à Sphaignes complètement exploitée - au-desus d'une argile limoneuse rouge riche en goethite, dans la région de Shippagan.
(Water-Managemant and Fertilization of a Cut-Over Sphagnum Peat Underlain by a Geothite-Rich Red Silty Clay in the Shippagan Area - Part of the Reclamation of Cutover Peatlands Program).

CONTRACT # 24ST-01916-4-PT01 **COST** $26,000.

ORGANIZATION Centre universitaire de Shippagan,
Shippagan, N. B.
E0B 2P0

PRINCIPAL INVESTIGATOR Jean-Yves Daigle.

DURATION 31 May 1984 to 31 December 1984.

SPONSOR Agriculture Canada.

SCIENTIFIC AUTHORITY Dr. S.P. Mathur / Dr. M. Lévesque,
Institut de recherche sur les terres,
Edifice K.W. Neatby,
Ferme expérimentale centrale,
Ottawa, Ontario.
K1A 0C6

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984	$26,000.		$26,000.

STATUS AND COMMENTS

Study done in the framework of the regeneration programme for cut-over peat areas.

REPORTS

TITLE Atlas macrofossile de l'Est du Canada.
(Macrofossil Atlas of Eastern Canada).

CONTRACT # **COST**

ORGANIZATION Laboratoire de paléobiogéographie et de palynologie
Département de géographie,
Case postale 6128,
Université de Montréal,
Montréal, Québec.
H3C 3J7

PRINCIPAL INVESTIGATOR Alayn Larouche; (514) 270-5671
Henri Dinel; Marcel Lèvesque,
and Pierre Richard.

DURATION June 1983 to June 1985.

SPONSOR EMR and Agriculture Canada.

SCIENTIFIC AUTHORITY Dr. Marcel Lèvesque,
Institut de recherche sur les terres,
Branche Recherche,
Dèpartement d'agriculture,
K.W. Neatby Building,
Ferme expèrimentale centrale,
Ottawa, Ontario.
K1A 0C5 (613) 995-5011.

OBJECTIVE

To put together an atlas containing the principle macrofossil remains encountered in holocene peat sediments in Eastern Canada. Identification keys of these remains will be dealt with.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

REPORTS

PRODUCT DEVELOPMENT AND STANDARDS

The discovery and trial of new methods of characterizing and processing peat; research to improve and develop novel methods (technologies) of converting mined peat into a moree effective, more marketable commodity for energy production; work to develop proven peat science into viable Canadian industrial processes and to upgrade existing industry practice through the application of scientific and engineering research.

TITLE Use of Saskatchewan Peat Moss as an Absorbant for Oilfield Emulsions and Oily Water Clarification.

CONTRACT # **COST** $15,000.

ORGANIZATION Saskatchewan Minerals,
Box 120,
Chaplin, Saskatchewan.
S0H 0V0

in conjunction with:
Saskoil Research & Development,
515 Henderson Drive,
Regina, Saskatchewan.

PRINCIPAL INVESTIGATOR Gordon F. Miller,
for Saskatchewan Minerals;

Richard J. Parker,
for Saskoil.

DURATION September 1983 to March 1984.

SPONSOR

SCIENTIFIC AUTHORITY Gordon F. Miller,
Director of Engineering & Research,
Saskatchewan Minerals,
Box 120,
Chaplin, Saskatchewan.
S0H 0V0 (306) 395-2561.

OBJECTIVE

To determine the effectiveness of peat moss as an absorption agent for crude oil and water soluble pollutants.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	Sask. Minerals		$ 7,500.
	Saskoil		$ 7,500.
			$15,000.

DESCRIPTION

If peat moss could be proven economical to clarify black water it would permit reuse of the water. Test procedures ranged from small laboratory sized filter funnels and glass columns to larger quantities of peat moss contained in 23 litre pails. Various pretreatments of the peat moss improved absorption effectiveness for some oil mixes.

STATUS AND COMMENTS

While the tests indicated that peat moss could have some potential for cleaning up oil from oily wastewater, a decision was made to discontinue testing. A more sophisticated study by a graduate student over a 2 year period could not be funded.

REPORTS

TITLE Extraction of Nutrients from Peat and their Utilization as Fermentation Substrate and as Fertilizer.

CONTRACT # **COST**

ORGANIZATION Department of Biochemistry,
Memorial University of Newfoundland,
St. John's, Newfoundland.
A1B 3X9

PRINCIPAL INVESTIGATOR Dr. A.M. Martin.

DURATION 1 April 1984 to 31 March 1987.

SPONSOR NSERC.

SCIENTIFIC AUTHORITY

OBJECTIVE

The objective of this project is the optimization of the nutrient extraction from peat and the utilization of peat extracts in the development of two fermentation products: edible mushroom mycelium from Agaricus campestris and single cell protein from Scytalidium acidophilum, and in the production of a peat based liquid fertilizer.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984-85	NSERC		$12,243.
1985-86	NSERC		$12,243.
1986-87	NSERC		$12,243.

DESCRIPTION

1. Development of the process of peat hydrolysis.
Objective: with the basic data obtained at the laboratory scale, the design of appropriate equipment for the peat process will be undertaken. This will make possible the scale-up of the extraction process, the production of larger quantities of peat extracts and the technological and economic evaluation of the process.
2. Studies in the production of mushroom mycelium.
Objective: research in the submerged growth of *A. campestris* mycelium with the objective of obtaining a food and a flavoring product.
3. Growth of the acid-tolerant fungus *Scytalidium acidophilum* in peat extracts.
Objective: one of the main problems in the process of nutrient extraction from peat is the very low pH of the extracts, in the range of 1.0 to 1.5 which requires neutralizing prior to fermentation when utilizing most of the microorganisms with commercial value. It is our opinion that this species has desirable characteristics as SCP source which justifies research in growing it in peat extracts media. In fermentations with *S. acidophilum* it can be anticipated that neutralization requirements of the media will be reduced and no costly asceptic conditions will be needed due to the low pH required in the growth process.
4. Development of a peat based liquid fertilizer.
Objective: peat has long been used as a soil conditioner in gardening. In addition, it has been found that the application of biologically active peat chemicals facilitates the growth of plants, shortens the period of their development and enhances crops. Considering that peat extracts obtained have a chemical composition which could be utilized as a nutrient source for plants, a collaboration has been established with the Department of Biology, Memorial University of Newfoundland, in study of peat extracts as a liquid fertilizer.

STATUS AND COMMENTS

There is a notable interest both in government and in the private sector in exploiting the vast peat resources in Newfoundland. Several projects, including a multimillion dollar plan to supply peat as fuel to paper mills are under way. Our research has been aimed towards developing a method to extract the biological stimulants existing in peat and to utilize them in fermentations. Simultaneously, a solid peat residue is produced with improved characteristics as fuel, because it can be dried more easily than the original peat. It is our belief that the work done in this project has been productive and the results encouraging. Due to the potential scientific, industrial and socio-economic implications of this research a further development of this project has beeh proposed.

REPORTS

1. Martin, A.M., Adaptation of *Agaricus campestris* (NRRL 2334) to a Peat Extract Medium. Can. J. Microbial. 29,108,1983.

2. Martin, A.M., Submerged Production of *Agaricus campestris* Mycelium in Peat Extracts. J. Food Sci. 48,206,1983.

3. Martin, A.M., Submerged Production of Edible Mushroom Mycelium. Can. Inst. Food Sci. Technol. J. 16(3); 215, 1983.

4. Martin, A.M. and Bailey, V.I., Studies on the Acid Hydrolysis of Peat. J. Chem. Technol. and Biotechnol. 34B: 70,1984.

5. Martin, A.M., Bioconversion of Peat: Utilization of Peat Extracts as a Fermentation Substrate. Proc. of the Boreal Forest Symposium, Thunder Bay, Ontario. 23-26 Aug. 1982. Association of Canadian Universities for Northern Studies. p. 370, 1983.

6. Martin, A.M. and Bailey, V.I., Production of Fungal Biomass in Peat Acid Hydrolysates. Proc. International Symposium on Peat Utilization. Bemidji State University, Bemidji, Minnesota. 11-13 Oct. 1983.

TITLE Chemistry of Histosols.

CONTRACT # **COST**

ORGANIZATION Chemistry & Biology Research Institute,
Agriculture Canada,
Central Experimental Farm,
Ottawa, Ontario.
K1A 0C6

PRINCIPAL INVESTIGATOR H. Morita; (613) 995-3700 / 733-9163.

DURATION 1984-87.

SPONSOR Agriculture Canada.

SCIENTIFIC AUTHORITY H. Morita,
Agriculture Canada,
Ottawa, Ontario.
K1A 0C6

OBJECTIVE

1) elucidate the chemical composition of Canadian histosols using recently developed extractive technologies (e.g.supercritical fluids, pyrohydrolysis) and new developments in analytical chemistry (e.g.nuclear magnetic resonance spectroscopy, laser fluorescence spectroscopy, fourier transform infared spectroscopy, mass spectroscopy) with a view to ascertaining the role of botanical origin, managemant practices, environmental and climatic conditions on the chemical properties of the organic matter;

2) based on the known constitution of the organic matter, elaborate on the chemical processes associated with peat decomposition.

REPORTS

D.G. Cory, W.M. Ritchery, H. Morita. 1984. High resolution solid NMR of peats. Fuel (in press).

H. Morita and R.M. Measures. 1984. Some observations on the laser fluorescence spectroscopy of peat. Proc. Int. Symposium on Peat Utilization, Bemidji, Minnesota, p. 391-403.

TITLE Use of Clostridium Butylicum for the Production of Butanol and Acetone from Peat.

CONTRACT # 02SX.31926-3-0124 **COST** $43,882.

ORGANIZATION Frank Maine Consulting Ltd.,
71 Sherwood Drive,
Guelph, Ontario.
N1E 6E6

PRINCIPAL INVESTIGATOR Dr. C.W. Forsberg,
University of Guelph.

DURATION 1 February 1984 to October 1984.

SPONSOR National Research Council,
Atlantic Research Laboratory, Halifax.

SCIENTIFIC AUTHORITY T.E. Tibbetts, and J.D. Sheppard
NRC Atlantic Research Labs.
1411 Oxford Street, (same address)
Halifax, N. S.
B3H 3Z1
(902) 426-7532. (902) 426-7452

OBJECTIVE

To establish whether and under what conditions the fermentation to produce butanol and acetone by Clostridium butylicum, can be achieved on a laboratory scale, using the carbohydrate in peat processing water as the major carbon source.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	N.R.C.	FMCL	$30,000.
1984-85	N.R.C.	FMCL	$14,000.

DESCRIPTION

This project is to examine, in experimental detail, the possibility of producing chemicals from peat. Using the soluble carbohydrate fraction, fermentation trials are being conducted with Clostridium butylicum to produce butanol and acetone. The experimental work is being done at the University of Guelph by Drs. C.W. Forsberg and L.N. Gibbons on a sub-contract from Frank Maine Consulting Ltd. who is the project manager as well as conducting the non-experimental work.

STATUS AND COMMENTS

Project underway.

REPORTS

DECEMBER 1984.

PROGRAM MANAGEMENT AND INTERNATIONAL ACTIVITIES

Organizational infrastructure is a necessary component of effective research and development.

TITLE A Peat Research Directory for Canada (& Update)

CONTRACT # 037-651/0427, 038-523/3007
(& 040-708/3201) **COST** $55,000

ORGANIZATION Northern Design and Crafts,
36 Rideauview Terrace,
Ottawa, Ontario.
K2C 3R9

PRINCIPAL INVESTIGATOR Jim Collins (613) 224-7920

DURATION May 1981 - August 1982 (& May - October 1984)

SPONSOR Peat Forum and IPACE Peat Technical Working Group.

SCIENTIFIC AUTHORITY T.E. Tibbetts, Peat Program Manager,
N.R.C., Division of Energy R & D,
Atlantic Research Laboratory,
Halifax, Nova Scotia.
B3H 3Z1 (902) 426-7532

OBJECTIVE

To compile and update a directory of peat related research in Canada from 1970 to present. Since peat is a multidisciplinary Canadian resource, the directory is to include federal, provincial and private agency efforts relating in any way to research and development of peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82	11,635		11,635
1982-83	18,000		18,000
1984-85	16,500		16,500

DESCRIPTION

Peat has been studied in Canada as swamps, bogs, fens, marshes, muskeg, organic soil deposits, wetlands, marginal terrains, tourbe, tourbière, savane, and a number of other names. Although a major Canadian resource, peat falls only on the periphery of various academic and engineering disciplines. Many researchers in Canada have worked hard to increase Canadian knowledge and expertise relative to peat, but their efforts have been hampered by difficulty of access to each other. This directory is an initial step towards helping researchers to become better acquainted with each other's work - especially beyond the bounds of their own discipline. The directory is also intended to assist administrators to manage the peat-related Canadian research and development efforts more effectively.

Projects are researched from records of government contracts, letter, phone, and personal interview. A standard NRC project data sheet was provided. The directory was also to include bibliographic and other pertinent information. The project included two information gathering trips to Eastern Canada and a trip to Western Canada. A photographic record of many areas and places visited was also kept. The Update also includes a section on commercial vendors.

STATUS AND COMMENTS

A preliminary directory was submitted to the contractor in September 1981 in 50 copies. This was circulated for comment and critique. An updated version was completed between May and August 1982. This went through two printings and requests were made for an update. The present update was completed between May and October 1984. It contains highlights from the first directory as well as bibliography and project data forms updating work during the two years since the last directory.

REPORTS

Jim Collins A Peat Research Directory for Canada (1982)
----------- and Janis Webb Update of a Peat Research Directory for Canada (1984), Ottawa: National Research Council of Canada, Division of Energy R & D, (1982 and 1984).

Both are available from CISTI or the NRC Peat Program Manager, T.E. Tibbetts.

TITLE Peat Policy Coordination and Communication.

CONTRACT # 02SX.31926-3-0119 **COST** $63,992.

ORGANIZATION J. Phillip Nicholson,
Policy and Managemant Consultants Inc.,
234 Argyle Avenue,
Ottawa, Ontario. K2P 1B9

PRINCIPAL INVESTIGATOR Patricia M. Manuel; (613) 237-5885.
J. Philip Nicholson.

DURATION December 1983 to December 1984.

SPONSOR Peat Forum-
National Research Council,
Energy Mines and Resources,
Environment Canada.

SCIENTIFIC AUTHORITY T.E. Tibbetts,
Peat Program Manager,
NRC Atlantic Research Labs.,
1411 Oxford St.,
Halifax, N. S.
B3H 3Z1 (902) 426-7532.

OBJECTIVE

The project has the following major objectives:

- to establish a comprehensive, reliable and practical communications forum which, through the improved exchange of information on peat research, development and management responsibilities and activities, would encourage greater awareness and involvement in peat policy formulation;
- an assessment of the function which Canadian peat policy has and should follow, to support the development and provide a framework for the planning and coordination of future activities in the field;
- contribute to the evolution of methods for summarizing and expressing information about peat activities in standard formats which are easy to use and address the diverse interests and which may be readily amended to provide timely information.

FUNDING

Fiscal Year	Sponsor(s)			Total
	EMR	EC	NRC	
1983-84	$20,000	$8,000	$13,000	$41,000.
1984-85			$23,000	$23,000.

DESCRIPTION

The project will provide the following:

- a review of Canadian policies and guidelines which are being or may be used to direct peat-related activities, and an assessment of their applicability to current and future research, management and development activities in this field;
- identification of the major actors in peat and organization of their responsibilities and activities within thematic and jurisdictional categories;
- identification and evaluation of common concerns, issues, interests, and initiatives related to peat research, management and development pursuits;
- identification of known or potential conflicts, duplications and overlaps in the above activities and initiatives;
- an assessment of international approaches to peat resource policy and management, and their implications for Canadian policies and guidelines.

STATUS AND COMMENTS

A final report will be available December 1984.

REPORTS

Final report will be available through the sponsor.

TITLE Canadian National Committee - International Peat Society

ORGANIZATION Secretary-Treasurer: T.E. Tibbetts,
c/o NRC Atlantic Research Laboratory,
1411 Oxford Street,
Halifax, Nova Scotia.
B3H 3Z1 (902) 426-7532

DURATION On-going - since early 1970's

SPONSOR Federal Government, Peat Forum

OBJECTIVE

In accordance with the aims and constitution of the International Peat Society: to promote international understanding and co-operation on all matters concerning the study and utilization of peatlands, bogs, peat and related materials with a view to advancing progress in the scientific, technical, and economic fields.

DESCRIPTION 1983-84 Council:

B. Bélanger, Les Tourbières Premier Ltée, C.P. 482,
Riviére du Loup, Québec. G5R 3Z1

C.A. Carncross, 1324 W.57th Avenue, Vancouver, B.C. V6P 1S8

E. Chornet, Faculté des Sciences Appliqueés, Université de
Sherbrooke, Sherbrooke, P.Q. J1K 2R1

D.E. Gemmell, Commerce and Development, P.O. Box 6000,
Fredericton, N.B. E3B 5H1

R.B. Graham, 54 St. Leonards Ave., Toronto, Ont. M4N 1K3

Terry G. Howe, Carrot River Peat Moss, Box 790,
Carrot River, Saskatchewan. S0E 0L0

G.W. Mankinen, Monenco Ltd., 155 Rexdale Blvd., Rexdale,
Ontario. M9W 5Z8

B.M. Sterckeman, Manitoba Peatland Farming Assoc. Inc.,
Box 760, Steinback, Manitoba. R0A 2A0

T.E. Tibbetts, NRC - address above.

Leo White, Nfld. & Lab. Peat Assoc., Memorial University,
St. John's, Newfoundland. A1B 3X5

STATUS AND COMMENTS

The first international meeting of peat researchers was held in Dublin in 1954, followed by a second Peat Congress in Leningrad in 1963. The International Peat Society was officially inaugurated in Quebec City, P.Q. in 1968. The Canadian National Committee was set up in the early 1970's. The federal government has always provided a certain amount of assistance through the auspices of the Secretary Treasurer, Ted Tibbetts. There are currently about 150 individual members and 15-20 corporate members across Canada. Reports of congresses and conferences are available to members or through the NRC/CISTI Energy Library.

REPORTS

Peat Abstracts (Published by Bord no Mona, Ireland).
Annual Bulletin of IPS.
Journal of IPS (to be published in 1985).
Conference Proceedings:
  a) 3rd International Peat Congress, 1968;
  b) Canadian Peat Symposium, Fredericton, N.B., 1979;
  c) Symposium on Peat - An Awakening Natural Resource, Thunder Bay, Ont., 1981;
  d) Symposium '82 on Peat and Peatlands, Shippagan, N.B. 1982;
  e) Symposium '83, Energy from Peat, St. John's, Nfld., 1983.
Distribution of reports from contractual R & D of the Peat Program (see Peat Forum).
Membership lists.

TITLE Interministerial Committee on Peat (Ontario).

CONTRACT # **COST** $40,000. per annum.

ORGANIZATION Ontario Ministry of Northern Affairs,
Natural Resources and Energy,

PRINCIPAL INVESTIGATOR Dr. P.G. Telford.

DURATION 1984 - 1987.

SPONSOR Ontario Ministry of Northern Affairs and
Natural Resources and Energy.

SCIENTIFIC AUTHORITY Dr. P.G. Telford, ICOP Chairperson,
Ontario Geological Survey,
Ministry of Natural Resources,
Room 706, 77 Grenville Street,
Toronto, Ontario.
M5S 1B3

OBJECTIVE

To stimulate and assist in the development of Ontario's peat resources as a contribution to Provincial goals of:

1) increased energy self-sufficiency
2) job creation
3) industrial diversification of northern communities.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984-85	MNR		$40,000.
1985-86			$40,000.
1986-87			$40,000.

DESCRIPTION

1) Identify requirements for peat development in Ontario;

2) Identify gaps in the knowledge of peat and it's uses;

3) Define medium and long range program targets and development opportunities;

4) Co-ordinate and recommend the use of available funds, and seek additional funds to ensure efficient and effective encouragement of the development of peat resources;

5) Provide a focal point within Provincial Government for peat-related matters, and a "one-window" for public enquiries;

6) Encourage effective communication on peat-related matters between the Ontario Government, other agencies and the private sector.

STATUS AND COMMENTS

ICOP work plan approved and committee set for 3 - year period (fiscal 1984 - 1987).

Formation of the Committee is as follows:
Chairman - P.G. Telford, Ont. Geological Survey, MNR
Secretary - J.A. Stocking, Min. of Natural Resources
Members: Earle Stobart, Ontario Ministry of Energy
Hans Von Cube, Ministry of Northern Affairs

To receive communications contact:
The Secretary c/o Dr. P.G. Telford.

REPORTS

Fiscal year-end reports to three member Ministries, periodic news releases, situation updates, etc.

TITLE National Wetlands Working Group.

CONTRACT # In-house **COST**

ORGANIZATION Chairman: Land Resource Institute,
Room 3002, K.W. Neatby Building,
Agriculture Canada,
Ottawa, Ontario. K1A 0C6

PRINCIPAL INVESTIGATOR Charles Tarnocai, chairman;
(613) 995-2323.

DURATION On-going since early 1970's.

SPONSOR Lands Directorate,
Environment Canada,
Ottawa, Ontario.
K1A 0E7

SCIENTIFIC AUTHORITY Each member of group - but reports
published by Clay Rubec,
Lands Directorate,
Environment Canada,
Ottawa, Ontario.
K1A 0E7 (819) 997-2320.

OBJECTIVE

To co-ordinate and encourage research in Canadian Wetlands. The National Wetlands Working Group began informally as a subcommittee of the National Committee on Forestland in 1970. Since 1976, the Group is a subcommittee of the Canadian Committee on Ecological Land Classifiction. The Group has had an annual meeting and serves as a co-ordinating and informing authority on various aspects of resource and ecological assessment pertaining to each. Each province also has its own provincial working group.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Newfoundland: Mr. E.D. Wells, Nfld. Forest Research Centre, Environment Canada, P.O. Box 6028, St. John's, Nfld. A1C 5X8 (709) 737-4862.

Nova Scotia, Prince Edward Island and New Brunswick: Mr. Hirvonen, Office of the Regional Director General, Environment Canada, 45 Alderney Dr., Dartmouth, N. S. B2Y 2N6

Québec: M. J. Ouzilleau, Dryade Ltée, 642 Boulevard St-Cyrille ouest, Québec, Québec. G1S 1S8 (418) 681-0687.

Ontario: Mr. A.N. Boissoneau, Ont. Centre of Remote Sensing, Ministry of Natural Resources, 810 Bay St.. Toronto, Ontario. M5S 1Z1 (416) 965-8411.

Manitoba: Prof. J. Shay, Dept. of Botany, 435 Buller Bldg., U. of Manitoba, Winnipeg, Manitoba. R3T 2N2 (204) 474-8176.

Saskatchewan: Dr. G.D. Adams, Canadian Wildlife Service, 115 Perimeter Rd., Saskatoon, Saskatchewan S7N 0X4 (306) 665-4087.

Alberta and N.W.T.: Mr. S.C. Zoltai, Northern Forest Research Centre, Environment Canada, 5320-122nd Street, Edmonton, Alberta. T6H 3S5 (403) 435-7304.

British Columbia: Dr. E. Oswald, Pacific Forest Research Centre, 506 W. Burnside Rd., Victoria, B.C. V8Z 1M5 (604) 388-3811 ext. 225.

STATUS AND COMMENTS

- The National Wetlands Working Group has established a national Wetlands Classification system for Canada. A national Wetlands Registry is now established and regional classifications are now continuing.
- It is hoped that a book on wetlands of Canada will be produced by 1984/85. Since some 90% of wetlands' areas are peatlands, the ecological classification developed and inventoried by this group are of considerable value to peatlands research.

REPORTS

- *Proceedings of a Workshop on Canadian Wetlands*, eds: Dr. F.C. Pollett and C.D.A. Rubec, Environment Canada, Lands Directorate, Ecological Land Classification Series #12, 1980.
- A public information brochure on the National Wetlands Working Group is to be made available through the Environment Canada Lands Directorate in Fall 1981.
- A set of two maps has been produced: "Wetlands of Canada - Terres Humides du Canada", Ecological Land Classification Series No. 14, Ministry of Supply and Services, 1981. Cat. No. EN 73-3/14.0 ISBN0-662-51346-0.

TITLE Peat Forum

ORGANIZATION Peat Forum,
Division of Energy,
National Research Council,
Ottawa, Ontario.
K1A OR6

PRINCIPAL INVESTIGATOR represents each federal department involved in peat research and development

DURATION ongoing since 1981.

SPONSOR Federal Government, National Research Council Canada.

CHAIRPERSON Dr. Ralph Overend (Chairman),
Co-ordinator of Bio-Energy,
Division of Energy R&D,
National Research Council,
Montreal Road Labs.,
Ottawa, Ontario.
K1A OR6 (613) 993-1342.

OBJECTIVE

The Peat Forum was formed, in 1982 by the N.R.C. which is the federal government's lead agency for renewable energy R & D, to co-ordinate federal government research and development activities related to peat as a fuel and chemical feedstock. Peat constitutes some 10-20% of Canada's land area. It is found in every Province and Territory. Because of the multidisciplinary and cross-jurisdictional nature of peat, and the complex state-of-the-art of its inventory, co-operation in R & D is of paramount importance if this important Canadian resource is to be conserved and utilized judiciously.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	NEP	NRC/EC/AC	$1,500,000
1983/84	NEP	NRC/EC/AC	$1,600,000
1984/85	NEP	NRC/EC/AC	$1,800,000

MEMBERSHIP

T.W. Anderson, Terrain Sciences Division, Geological Survey of Canada, 601 Booth Street, Ottawa, Ont. K1A 0E8

Bill Blakeman; Head, Mineral and Metallurgical Processes Section, Environment Canada, Place Vincent Massey, 13th floor- 351 St. Joseph Blvd., Hull, Québec.K1A 1C8

F.R. Campbell, Office of Energy Research & Development, Energy Mines and Resources Canada, 9th Floor- 580 Booth Street, Ottawa, Ontario. K1A 0E4

Ian Flann and Bill Warfe, Biomass, Energy, Mines and Resources, 580 Booth St., Ottawa, Ontario. K1A 0E4

Ralph Overend; Chairman (address: see scientific authority), (613) 993-1342.

Fred Pollett, Director, Pettawawa National Forestry Inst., Environment Canada, Chalk River, Ont. K0J 1J0

J. Ian Sneddon, Land Use Planning Directorate, Northern Environment Branch, DIAND, Ottawa, Ont. K1A 0H4

Ted Tibbetts; Secretary; Peat Program Manager, N.R.C.C. Atlantic Research Lab., 1411 Oxford St., Halifax, N. S. B3H 3Z1 (902) 426-7532.

J. van Schaik, Land Resource Inst., Agriculture Canada, Central Experimental Farm, Ottawa, Ont. K1A 0C6

STATUS AND COMMENTS

Approximately one half of the funds are currently being spent on problems related to inventory and environmental protection. The remaining monies are being used to look at novel methods of peat utilization.

NB: Because of the land use implications of peat utilization for energy and the likely use of conversion technologies developed under the auspices of the bioenergy R & D program, peat has been classified as a Renewable Energy Source for administrative purposes only. Peat is a non-renewable source which is part of the continuum that takes living biomass to fossil fuels such as coal, oil and gas.

REPORTS

The following reports prepared under the auspices of the Peat Forum are available from NRC-CISTI Energy Library or T.E. Tibbetts, Peat Program Manager, NRC.

- Proceedings of a peatland inventory methodology workshop. LRRI/NFRC. Sponsor LRRI/AC & NFRC/EC.
- Study of the technology and costs associated with dredging and overburden clearing operations for the recovery of peat. NRCC 20599 (Kesmark Ltd.) Sponsor.
- Report on a study on the biogasification of peat. NRCC 20600. (ADI Ltd.). Sponsor.
- Survey of literature on the assessment of the pollution potential of the peat resource. NRCC 20755 (Washburn & Gillis Assoc. Ltd.). Sponsor: EC.
- The use of impulse radar techniques for depth profiling of peat deposits. NRCC 20982 (Remotec Applications Inc.). Sponsor: NRC.
- A peat research directory for Canada. NRCC 21000 (J. Collins).
- Fish and wildlife use of peatlands in Canada. NRCC 21238 (IEC Beak Consultants Ltd.). Sponsor: NRC.
- Identification of the pollution potential of the harvesting and preutilization processing of peat as an energy commodity. NRCC 22858 (Monenco Ontario Ltd.). Sponsor: EC.
- Pollution Potential of peat combustion, liquefaction & gasification. NRCC 22859 (Monenco Ontario Ltd.). Sponsor: EC.
- The Technical Research Centre & the Peat Industry in Finland. NRCC 23014 (John Sheppard, Nrc (ARL)).
- Essais combustion boudins de tourbe provenant des toubières du lac St-Jean/Combustion tests on sod peat from peat bogs of the Lac St-Jean Region, Québec. NRCC 23015 (André Marsan et Associés/Conseil Economique d'Alma et du lac At-Jean). Sponsor: NRC.
- An evaluation of alternative wet peat mining systems. NRCC 23016 (Monenco Ontario Ltd.). Sponsor: NRC.
- Process evaluation and conceptual design of plant based on a technical and economic assessment of peat dewatering and peat fuel processes - Phase 1. NRCC 22911 (Montreal Engineering Co. Ltd.). Sponsor: NRC.
- Evaluation of data from 1982 sampling program of potential pollutants in water and peat samples from three peet bogs in Canada. NRCC 23214 (Washburn & Gillis Associates Ltd.). Sponsor: EC
- Wastewater characteristics of five peat dewatering processes. NRCC 23758 (Ontario Research Foundation). Sponsor: EC.
- Wet oxidation of peat liquid and solid fractions for environmental and energy studies. NRCC 23806 (Ontario Research Foundation). Sponsor: EC/NRC

TITLE Peatlands Subcommittee of the NRC's Associate Committee on Geotechnical Research.

CONTRACT # **COST**

ORGANIZATION Division of Building Research,
National Research Council of Canada,
Ottawa, Ontario.
K1A 0R6

PRINCIPAL INVESTIGATOR Mr. W.R. Wiesner (Chairman)
(204) 889-6630.

DURATION 1947 - Present.

SPONSOR National Research Council of Canada.

SCIENTIFIC AUTHORITY Mr. V. Milligan,
Chairman, Associate Committee on
Geotechnical Research,
c/o Golder & Associates,
3151 Wharton Way,
Mississauga, Ontario.
L4X 2B6 (416) 625-0094.

OBJECTIVE

To define the problem areas in the geotechnical aspects of peatland utilization, advise the Associate Committee on research needs, follow through actively in promoting research, and assist in the publication and application of the results of research.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION (Formerly named "Muskeg Subcommittee")

Research Advisor: Mr. T.H.W. Baker, Building Research, NRC,
Ottawa.
Secretary: Mrs. J. Curran, Building Research, NRC, Ottawa.

Members: Mr. W.R. Wiesner (Chairman)
Hardy Associates (1978) Ltd.,
425 Berry Street,
Winnipeg, Manitoba. R3J 1N6

Dr. E. Chornet,
Department of Chemical Engineering,
University of Sherbrooke,
Sherbrooke, Québec. J1K 2R1

Dr. P.M. Jarrett,
Department of Civil Engineering,
Royal Military College,
Kingston, Ontario. K7L 2W3

Dr. E. Korpijaakko,
Mining Department,
Montreal Engineering Co. Ltd.,
Colonia Place,
2 St. Clair Avenue East,
Toronto, Ontario. M4T 2T5

Dr. A. Landva,
Department of Civil Engineering,
University of New Brunswick,
P.O. Box 4400,
Fredericton, N. B. E3B 5A3

Mr. J.R. Radforth, President,
Peat Consultants, Canada, Ltd.,
P.O. Box 248,
Bracebridge, Ontario. P0B 1C0

Dr. P.J. Rennie,
Canadian Forestry Service,
Environment Canada,
19th Floor, Place Vincent Massey,
Ottawa, Ontario. K1A 0E7

Mr. P. Rosenberg,
Lupien, Rosenberg, Journeaux et associés inc.,
960, 24e avenue,
Lachine, Québec. H8S 3W7

Mr. J. Rymes,
J.E. Rymes Engineering Ltd.,
6319 Bowness Road N.W.,
Calgary, Alberta. T3B 0E4

Dr. J.M. Stewart,
Department of Botany,
University of Manitoba,
Winnipeg, Manitoba.

Mr. C. Tarnocai,
Land Resource Research Institute,
Central Experimental Farm,
Ottawa, Ontario. K1A 0C6

Mr. T.E. Tibbetts,
Manager, Peat Program,
National Research Council,
1411 Oxford Street,
Halifax, N. S. B3H 3Z1

Mr. N.E. Wilson,
Nyal E. Wilson & Associates Ltd.,
22 Sulphur Springs Road,
Ancaster, Ontario. L9G 1L9

STATUS AND COMMENTS

The Peatlands Subcommittee is preparing to hold a National Conference in 1986 in Ottawa entitled "Peatlands: Engineering, Design and Construction".

REPORTS

"Testing of Peats and Organic Soils" - sponsored jointly with ASTM - ASTM STP 820 - P.M. Jarrett, Editor, 241 p. 1983.

"Canada's Peatlands: The Need for Research and Development" - Geotechnical News, Vol. 1, No. 3, 1983.

"Geotechnical R&D Needs in Canada", 18 p. 1983, NRCC 22720.

TITLE Centre de recherche et dèveloppement de la tourbe
(Peat Research and Development Centre)

CONTRACT # **COST** $355,100.

ORGANIZATION Centre universitaire de Shippagan,
Shippagan, N. B.
EOB 2PO

PRINCIPAL INVESTIGATOR Jean-Yves Daigle.

DURATION 1 April 1983 to 1 March 1985.

SPONSOR Ministry of Regional Industrial Expansion and the Province of New Brunswick.

SCIENTIFIC AUTHORITY Jean-Yves Daigle,
Centre universitaire de Shippagan,
Shippagan, N. B.
EOB 2PO

OBJECTIVE

To promote the development of research facilities at the Université de Moncton, Campus de Shippagan and to carry out research in all aspects of the industry.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

1- to carry out research in methods of transportation for peat to various markets;

2- to carry out research on new products both horticultural and industrial derived from peat;

3- to carry out research into new methods of harvesting and packaging of peat;

4- to research quality control and classification of peat to be packaged an placed on the market by N.B. Peat Producers;

5- to acquire a reference library on all peat matters accessible to all producers;

6- measures which affect the post usage of lands once harvesting has ceased;

7- measures which affect the packaging and labelling of the product;

8- to offer laboratory analysis service to peat producers.

STATUS AND COMMENTS

This project fills an existing gap in the peat industry in New Brunswick. An excellent collaboration has been established between the University Centre and industry regarding functionning.

REPORTS

1- Study on the quality of peat placed on the market by New Brunswick producers.

2- Several analysis recommendation reports and made to individual producers.

TITLE IPACE - Peat Technical Working Group.

ORGANIZATION Peat Technical Working Group (PTWG) of the inter-provincial Advisory Committee on Energy (IPACE).

PERFORMERS Representatives from each province and the federal government.

DURATION on-going.

SPONSOR Provincial governments.

CHAIRPERSON Alex Winsor, Energy Economist,
Energy Policy Division,
Department of Mines and Energy,
P.O. Box 4750,
Bonnaventure Avenue,
St. John's, Newfoundland.
A1C 5T7 (709) 737-3159.

OBJECTIVE

1) To strengthen communication with and between government and the private sector:
   - contact private sector and channel information gathered to the appropriate groups;
   - identify the possible markets for peat in each province and channel this information to the appropriate groups.

2) To identify and advise, via the IPACE COMMITTEE, NRC, and other relevant groups of projects eligible for funding.

3) To exercise an important role in emphasizing the need for and development of demonstration projects to ensure adequate exposure and future funding in peat-related areas.

4) To act as a co-sponsor of the Peat Research Directory that is funded by the federal government Peat Forum.

DESCRIPTION

Provincial:

Alexander R. Anderson, Biologist, NS Dept. of Mines & Energy P.O. Box 668, Halifax, N.S. B3J 2T3.

Vern Bowerman, Chief, Renewable & Alternative Energy, Manitoba Dept. of Energy and Mines, 555-330 Graham Av., Winnipeg, Manitoba R3C 4E3 (204) 945-3417.

Paul Guliov, Head, Industrial Minerals Div., Sask. Dept. of Mineral Resources, 1914 Hamilton St., Regina, Sask. S4P 4V4 (306) 565-2583.

A.J. Hiscock, General Manager, P.E.I. Energy Corp., P.O. Box 2000, Charlottetown, P.E.I. C1A 7N8

R.D. MacDonald, Executive Director, Energy and Natural Resources, 9915-108 Street, 9th Floor Petroleum Plaza South Tower, Edmonton, Alberta. T5K 2C9

Arthur J. Plumpton, Ministère de l'energie et des ressources, Centre de recherches minérales, 2700 rue Einstein, Ste-Foy, Québec G1P 3W8

Ron Shaw, Peat-Coal Geologist, Mineral Development Branch, N.B. Dept. of Natural Resources, Centennial Bldg. P.O. Box 6000, Fredericton, N.B. E3B 5H1 (506) 453-3687

Earle Stobart, P.Eng., Senior Policy Advisor - Coal - Uranium, Ministry of Energy, Queens Park, Toronto, Ontario. M7A 2B7

Alex Winsor, Current Chairperson, (address: see scientific authority)

Federal:

T.E. Tibbetts, Peat Program Manager, NRC Atlantic Labs. 1411 Oxford Street, Halifax, N.S. B3H 3Z1 (902) 426-7532.

STATUS AND COMMENTS

The committee is on-going and the last meeting was held in Newfoundland on 21 September 1983.

REPORTS

There have been no official reports from the committee but information concerning peat developments in the various provinces is available from the committee members.

TITLE BRITEQ - Bureau de recherche sur l'industrie de la tourbe dans l'est du Québec.

CONTRACT # **COST** $625,000

ORGANIZATION BRITEQ
90, rue Frontenac,
C.P. 1270,
Rivière du Loup, Québec.

PRINCIPAL INVESTIGATOR Raymond Boucher (Président).

DURATION 1978 - ongoing.

SCIENTIFIC AUTHORITY Raymond Boucher,
BRITEQ,
90, rue Frontenac,
C.P. 1270,
Rivière du Loup, Québec.

OBJECTIVE

The objective of this office is to help assure the expansion of the peat industry and its derivatives.

FUNDING

Fiscal Year	Sponsor	Total
1984	Employment and Immigration Canada	$625,000

DESCRIPTION

The projects accomplished by BRITEQ so far include a series of socio-economic studies where many were ordered by the Ministère de l'énergie et de ressource Québec.

STATUS AND COMMENTS

A building on land donated by CEGEP at Rivière du Loup toward this purpose will be completed in the spring of 1985.

REPORTS

- La tourbe et son avenir: colloque provincial sur la tourbe, 5 et 6 juin, 1982.

- Etude sur les intervenants, l'état et les besoins de la recherche minérale dans l'est du Québec; réalisation d'une étude préparée pour le centre de recherche minérale du Ministère de l'énergie et de ressources du Québec.

4.6.7

PEATLAND TRANSPORT

To improve mobility on peatland areas and enhance thereby the economics of operation on peat terrain; and research to minimize adverse environmental impact.

TITLE Mobility Model Development - Terrain Characteristics

CONTRACT # 8SU81-00094 **COST**

ORGANIZATION Department of Geography,
McGill University,
Montreal, Québec.

PRINCIPAL INVESTIGATOR Prof. J.T. Parry.

DURATION 43 months.

SPONSOR Chief, Research and Development,
Department of National Defence.

SCIENTIFIC AUTHORITY Dr. G.J. Irwin,
Vehicle Mobility Section,
Defence Research Establishment Suffield,
Ralston, Alberta.

OBJECTIVE

To evaluate terrain and to appraise terrain evaluation techniques relevant to the development of comprehensive mobility models for off-road vehicles.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82			114,000.
1982-83			111,200.
1983-84			72,200.
1984-85			45,500.

DESCRIPTION

Transects containing muskeg were chosen at CFB Petawawa and Schefferville, Québec. Muskeg has been described and classified in a manner pertinent to vehicle mobility. Studies have employed mainly colour aerial photography and ground truthing. Digital terrain models and computer graphics are a product of this work.

STATUS AND COMMENTS

Project continues at Schefferville, Québec to December 1984.
Muskeg investigations constitute less than 30% of total effort.

REPORTS

1. Report on the CFB Petawawa Transect
   January 1984, 10 copies.

TITLE The Design and Evaluation of Bevameter for Field Application

CONTRACT # 2SU77-00306 **COST** $89,000

ORGANIZATION Carleton University,
Ottawa, Ontario.

PRINCIPAL INVESTIGATOR Dr. J.Y. Wong,
Transport Technology Laboratory.

DURATION 18 months

SPONSOR Chief, Research and Development, DND.

SCIENTIFIC AUTHORITY Dr. G.J. Irwin,
Vehicle Mobility Section,
Defence Research Establishment,
Suffield,
Ralston, Alberta.
TOJ 2NO.

OBJECTIVE

To evaluate the bevameter technique for determining the mechanical properties of terrain in relation to vehicle mobility, and to make recommendations for the standardization of bevameter design specifications, test procedures and data processing methods including automated techniques.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1978-79			76,000
1979-80			13,000

DESCRIPTION

An M113A1 Armoured Personnel Carrier was instrumented for measurement of drawbar pull vs slip in dry muskeg at Bunker Hill (about 80 km south of Ottawa). The results compared well with predictions based on bevameter tests (applied pressure vs depth and applied shear stress vs rotational displacement) in the same muskeg.

An automatic data processing package was assembled and mounted on a mobile platform with the bevameter for in field printout of all relevant muskeg engineering properties data.

The bevameter method of vehicle performance prediction is recommended as a standard tool for vehicle users, test engineers and vehicle designers.

STATUS AND COMMENTS

Project completed. Final report in 10 copies includes 2 volumes of appendices and drawings of a recommended bevameter design.

Muskeg investigation constituted about 1/3 of total effort.

REPORTS

"The Design and Evaluation of a Bevameter for Field Application", dated May 1979. Prepared by J.Y. Wong.

TITLE Development of an Independently-Powered Flotation Drainage Digger and Rotoridger-Seeder Suitable for Use on Newfoundland Peat Soils.

CONTRACT # 075Z-0L843-8-0822 **COST** $154,172.00

ORGANIZATION Memorial University of Newfoundland,
Faculty of Engineering & Applied Sciences,
St. John's, Nfld., A1C 5S7.

PRINCIPAL INVESTIGATOR Dr. Allan Robb (709) 737-8948

DURATION 1 July 1978-31 August 1979

SPONSOR Agriculture Canada

SCIENTIFIC AUTHORITY Mr. H.W.R. Chancey,
Agriculture Canada Research Station,
P.O. Box 7098,
St. John's, Newfoundland,
A1E 3Y3. (709) 737-4619.

OBJECTIVE

To design, construct and further develop an independently powered Flotation Drainage Digger and a Rotoridger-Seeder suitable for use on peat soils in Newfoundland.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
		M.U.N. Engineering Faculty	$154,172.

DESCRIPTION

1) The requirements for ditch digging and ridging-seeding were to be determined through consultation with Agriculture Canada (ESRI) researchers and Nfld. Department of Agriculture Production planners.

2) A market search was to be made for available equipment in order to buy machines, components and mechanisms whenever possible.

3) Machines and components were to be assembled and constructed to meet the needs of the industry.

4) Purchased or rented equipment was tested and evaluated with necessary modifications made.

5) The equipment was then tested and developed as required to finally assure design met design criteria.

6) The use of the equipment was compared to existing equipment.

STATUS AND COMMENTS

The 1981 modification of the Floatation Drainage Digger was effective in correcting the imbalance of the machine when in travel (up) position. During the 1983 season, substitution of hydraulic lift pump with one of heavier design overcame a lifting problem as verified by extensive field observations. Periodic throwing of tracks and blow-out of the hydraulic drive motor activating the trencher are continuing problems.

No further work has been done to improve the performance of the ridger-seeder.

REPORTS

Two copies of the design criteria were forwarded to the Scientific Authority as soon as the criteria had been established.

Three copies of the final report were delivered to the Scientific Authority at the end of the contract period.

TITLE Construction of Roads over Highly Compressible Terrain.

CONTRACT # **COST**

ORGANIZATION Royal Military College of Canada,
Kingston, Ontario.
K7L 2W3

PRINCIPAL INVESTIGATOR Dr. Peter M. Jarrett.

DURATION On-going for more than 10 years.

SPONSOR Department of National Defence.

SCIENTIFIC AUTHORITY

OBJECTIVE

To establish construction and design procedures for pavements constructed over highly compressible soils such as peats.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	Tensar Inc.		$53,000.
1984-85	DND		$25,000.

DESCRIPTION

Presently the project is investigating the value of geotextile and geogrid reinforcement in the construction of roads over peats. This is being done using large scale laboratory tests of grave fills constructed over peat both with and without reinforcement. In addition, studies of field records are being made when possible.

Some basic work is also being undertaken into the stress-strain properties of peats to allow better analysis of the road construction problem.

STATUS AND COMMENTS

The work is on-going and expected to continue.

REPORTS

1. "The Use of Fabrics Beneath Compacted Fills on Peats."
   P.M. Jarrett.
   Proc. 18th Muskeg Research Conference. N.R.C. Technical Memorandum.
   No. 127, June 1980.

2. "Large Scale Model Tests on Gravel-Fabric-Peat Systems."
   P.M. Jarrett.
   Proc. 1st Canadian Symposium Geotextiles, Calgary, Sep 1980.

3. "Reinforcement of Roads on Organic Terrain".
   P.M. Jarrett.
   Proceedings of the 7th Panamerican Fonference on Soil Mechanics and Foundation Engineering, Vol. 1,
   pp. 329-342, Jun 1983.

4. Evaluation of geogrids for construction of roadways over muskeg".
   P.M. Jarrett.
   Accepted for Symposium on Polymer Grid Reinforcement in Civil Engineering, London, Mar. 1984.

TITLE The Development of a Method for Predicting the Off-Road Performance of Tracked Vehicles.

CONTRACT # 2SU79-00324 **COST** $434,080.

ORGANIZATION Carleton University
Ottawa, Ontario

PRINCIPAL INVESTIGATOR Professor J.Y. Wong
Director/Transport Technology Research Laboratory

DURATION 50 months.

SPONSOR Chief, Research and Development
Department of National Defence.

SCIENTIFIC AUTHORITY Mr. J. Williams
Head/Vehicle Mobility Section
Defence Research Establishment Suffield
Ralston, Alberta

OBJECTIVE

To develop and validate a method suitable for the evaluation and prediction of the tractive performance of tracked vehicles on specified types of marginal terrain.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1980-81			138,000
1981-82			106,000
1982-83			100,000
1983-84			62,500
1984-85			20,000

DESCRIPTION

Project consisted of the following tasks:

a) development and validation of method for characterization of mechanical properties of muskeg (2 sites at CFB Petawawa);

b) development and validation of method for predicting stress distribution at track-terrain interface;

c) development and validation of method for predicting slip sinkage and tractive performance of tracked vehicles on muskeg;

d) development of computer model based on above validated methodologies.

STATUS AND COMMENTS

Project Completed.

REPORTS

1. Field Measurements of the Mechanical and Physical Properties of Two Muskeg Sites at CFB Petawawa, Vol. 1 and 2, March 1982, 5 copies.

2. Further Evaluation of the Shear Stress-Shear Displacement Relationship of Simple Exponential Form, May 1984, 3 copies.

3. Development of a Method for Predicting the Off-Road Performance of Tracked Vehicles, Final Report, April 1984, 10 copies.

TITLE Terrain Analysis for Off-Road Vehicle Mobility

CONTRACT # 8SU78-00232 **COST** $158,000

ORGANIZATION University of British Columbia,
Vancouver, B.C.

PRINCIPAL INVESTIGATOR Dr. L.M. Lavkulich,
Dept. of Soil Science.

DURATION 27 months.

SPONSOR DND.

SCIENTIFIC AUTHORITY Dr. C.M. Tucker,
Vehicle Mobility Section,
Defence Research Establishment,
Suffield,
Ralston, Alberta.

OBJECTIVE

To develop suitable methods of terrain analysis for off-road vehicle mobility including the evaluation of terrain parameters obtained by direct and indirect methods.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1978-79			42,000
1979-80			88,000
1980-81			28,000

DESCRIPTION

Transects were established near Fort Churchill, Manitoba and in the Richardson Mountains near Old Crow, Yukon. Satellite imagery was used in the production of multi-date colour-enhanced displays of terrain trafficability via digital enhancement and cluster analysis. Colour infra-red aerial photographs and thermal infra-red data were used to relate plant community distributions and ground thermal patterns.

STATUS AND COMMENTS

Project completed. Final reports in 10 copies submitted to sponsor.

Muskeg investigation constituted approximately 25% of total effort.

REPORTS

"The Use of Numerical and Remote Sensing Techniques for Terrain Mobility Assessments", dated 31 March 1980. Prepared by H. Schreier and L.M. Lavkulich.

"An Evaluation of Thermal-IR and Laser Remote Sensing Techniques for Arctic Terrain Assessment", dated 2 January 1981. Prepared by H. Schreier and L.M. Lavkulich.

TITLE Development of Traction Mechanics Computer Models that will Aid in Evaluating the Off-Road Mobility of Military Wheeled Vehicles.

CONTRACT # 0ST82-00107 **COST**

ORGANIZATION Geotechnical Research Centre
McGill University
Montreal, Quebec. H3A 2K6

PRINCIPAL INVESTIGATOR Professor R.N. Yong

DURATION 2 years.

SPONSOR Chief, Research and Development
Dept. of National Defence.

SCIENTIFIC AUTHORITY Dr. G.J. Irwin
Vehicle Mobility Section
Defence Research Establishment Suffield
Ralston, Alberta

OBJECTIVE

To develop traction mechanics models for evaluating the mobility of military wheeled vehicles in off-road environments.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83			115,000
1983-84			220,000
1984-85			95,000

DESCRIPTION

Project includes the development of a traction mechanics model for flexible tires on muskeg including the identification of pertinent muskeg engineering properties and, where evident, of the corresponding physical properties.

STATUS AND COMMENTS

Project in progress, final report pending.
Muskeg investigation constitutes about 1/3 of total effort.

REPORTS

1. Technical Report #1, November 1983, 4 copies.

4.6.7 PEATLAND TRANSPORT JAC 28/8/84

IN SITU USE

Energy and valuable resources can be conserved through effective "in situ" utilization of peatlands.

TITLE Drainage of Newfoundland Peat Bogs.

ORGANIZATION Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland. A1E 3Y3

PRINCIPAL INVESTIGATOR A.F. Rayment.

DURATION 1957 to present; revised 1983.

SCIENTIFIC AUTHORITY Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland. A1E 3Y3

OBJECTIVE

To determine optimum drainage practices for crop production in Newfoundland peat soils.

DESCRIPTION

Investigations of different drain liners and of supplementary (tertiary) slit drains in main experimental area; additional tests of back-fill depths with sawdust in general field area.

STATUS AND COMMENTS

Main experiment nearing close of useful data output except for subsidence measurements which could continue after conclusion of waterflow measurements.

REPORTS

1) Rayment, A.F. and D.J. Cooper. 1968. Drainage of Newfoundland peat soils for agricultural purposes. Proc. 3rd Int. Peat Congr., Québec. 345-349.
2) Rayment, A.F. 1970. Newfoundland peat bogs - drainage techniques. Canada Agriculture 15(3): 24-25.
3) Rayment, A.F. and F.R. Hore. 1976. Hydraulic conductivity and bulk density changes in the cultivated layer of a Newfoundland peat soil and initial effects of soil amendments. Proc. 5th Int. Peat Congr., Posnan, Poland.
4) Rayment, A.F. and J.A. Campbell. 1980. The influence of different drainage techniques on water outflow, soil aeration and crop growth on a Newfoundland peat soil. Proc. 6th Int. Peat Congr., Duluth, USA. 451-454.
5) Rayment, A.F., A.D. Robb and G.G. Bradshaw. 1980 Development of a rotoridger-seeder to form and seed raised beds for vegetable production on a Newfoundland peat soil. Proc. 6th Int. Peat Congr., Duluth, USA. 455-459.

TITLE Vegetable Production on Peatland

ORGANIZATION Rural, Agricultural and Northern Development, Agriculture Canada.

PRINCIPAL INVESTIGATOR Eugene Cooper. **DURATION** 5-6 years.

SPONSOR Canada, Newfoundland Agricultural Development Subsidiary Agreement.

SCIENTIFIC AUTHORITY Rural, Agriculture and Northern
Development, P.O. Box 4750,
Brookfield Road,
St. John's, Nfld., A1C 5T7.
& Agriculture Canada,
St. John's, Nfld.

OBJECTIVE

To examine the feasibility of vegetable production on Peatland.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1978-79	ADSA		
1979-80	ADSA		126,182
1980-81	ADSA		62,670
1981-82	ADSA		15,403
1982-83	ADSA		7,286

DESCRIPTION

To determine the feasibility of producing vegetables on peatland as a commercial enterprise by:

1) Examining machinery requirements and suitability of available machinery.
2) Examining drainage requirements for cultivation.
3) Examining fertility and crop suitability for use on peatland.

STATUS AND COMMENTS

Analysis and evaluation now being carried out by private consultant.

4.6.8 IN SITU USE JAC 28/8/84

TITLE Monitoring Subsidence of Organic Soils as a Function of Management Practices.

CONTRACT # N/A **COST**

ORGANIZATION Cloverdale Office,
B.C. Ministry of Agriculture and Food,
17720-57 Avenue,
Surrey, B.C., V35 4P9.

PRINCIPAL INVESTIGATOR R.C. Wood,
(604) 576-2911.

DURATION 5-10 years.

SPONSOR In House.

SCIENTIFIC AUTHORITY R.C. Wood,
Cloverdale Office,
B.C. Ministry of Agriculture and Food,
17720-57 Avenue,
Surrey, B.C.
V3S 4P9 (604) 576-2911.

OBJECTIVE

To measure subsidence and loss of surface soil to biological oxidation as affected by various management practices.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984-85	B.C.M.A.F.		200.00

Subsequent years at $200.00 per year.

DESCRIPTION

12 plots 3.16 x 3.16 are situated on a recently drained and cultivated Typic Mesisol, 6 m from a drainage ditch. Plots are subject to treatments as follows:

Management	Effect Measured
1. Fallow. Cultivated to 20 cm, 10 x during growing season	Bare soil and aeration from cultivation
2. Same as 1, plus lime to ph 6, plus 300 kg/ha N, P205, and K20	High Fertility and liming
3. Crop rotation with fertility and lime requirements basis soil test	Control, recommended practice
4. Same as 3, plus winter cover crop	Cover Crop
5. Same as 3, lime and fertilizer as in 2	High fertility and lime
6. Same as 5, plus winter cover crop	Cover Crop, high fertility and lime
7. to 12. Same as 1 through 6 plus plus 15 kg Cu/ha for three years, followed by sufficent Cu to achieve equivalent of 100 ppm Cu for each 0.1 g/cm3 B.D.	Cu effect

STATUS AND COMMENTS

Initiated July 1984

REPORTS

N/A

TITLE Evaluation of Vertical Mulch Technique For Improving Internal Drainage in an Organic Soil With Slowly Permeable Subsoil Horizons.

CONTRACT # N/A **COST** $200.00

ORGANIZATION Cloverdale Office,
B.C. Min. of Agriculture and Food,
17720-57 Avenue,
Surrey, B.C.,
V3S 4P9 (604) 576-2911

PRINCIPAL INVESTIGATOR R.C. Wood (604) 576-2911

DURATION 2 Years

SPONSOR B.C.M.A.F

SCIENTIFIC AUTHORITY R.C. Wood,
Cloverdale Office,
B.C. Ministry of Agriculture and Food,
17720-57 Avenue,
Surrey, B.C.,
V3S 4P9
(604) 576 2911.

OBJECTIVE

To evaluate effectiveness of vertical mulching technique.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984-85	B.C.M.A.F.		200.00

DESCRIPTION

In many fields in the Cloverdale area localized ponding occurs during the growing season. The ponding appears to be due to very low permeabliity subsurface horizons consisting of predominantly diatomaceous earth and in some cases, humic material with very firm (moist) consistency. Field observations confirm that these layers effectively perch water in the spring and during the summer after rainfall or irrigation. Conventional subsurface drainage systems are not effective in drying up localized ponded areas, even at 10 m. spacing.

In England, a vertical mulch technique was found effective in improving the function of underdrains in heavy-textured soils. The technique involved the creation of narrow trenches (3-5 cm) with a subsoiler shank and an infilling of the trench with wood shavings or chopped straw forced into the trench immediately behind the subsoiler shank with a blower. Mulching material was supplied in a hopper mounted on the subsoiler along with the blower and delivery tube.

Mulched trenches were made perpendicular to the underdrains, about 1 m. apart, and to a depth slightly above the drain line. The technique was reported to be quite effective in improving the drainage of certain clay soils. The treatment was repeated periodically.

Trenches are made 5-7 cm. wide and to a depth within 5 cm. of the existing tile drain tubing, spaced 1 m. apart and running perpendicular to the drain line. Wood shavings are placed in the trench and tamped moderately firmly with a 2 x 4, until the trench is filled to within 20 cm. of the surface.

The treated area will be a strip 10 m. wide and extending 2 m. beyond the ponded area, situated approximately in the middle of the ponded area.
Effect will be measured subjectively based on the farmer's experience.

STATUS AND COMMENTS

To be initiated August, 1983.

REPORTS

N/A

TITLE Demonstration of Equipment for Developing Organic Wetlands.

CONTRACT # **COST** $20,100

ORGANIZATION B.C. Ministry of Agriculture and Food,
Engineering Branch,
33832 S. Fraser Way,
Abbotsford, B.C., V2S 2C5.
& 17720-57 Avenue, Surrey, B.C., V35 4P9.

PRINCIPAL INVESTIGATORS Mr. Roly Kilpatrick, (604) 853-6451.
- Martin Driehuyzen, Soils and Water Management Specialist, B.C.M.A.F. Cloverdale Office, (604) 576-2911.
- John Metzger, Senior Agricultural Engineer, B.C.M.A.F. Abbotsford.
- Eric Reay, Farmer.

DURATION 1981-83.

SPONSOR B.C.M.A.F. Engineering Branch.

SCIENTIFIC AUTHORITY Roly Kilpatrick-Agriculture Engineer,
B.C. Min. Agri. and Food,
33832 S. Fraser Way,
Abbotsford, B.C., V2S 2C5.

OBJECTIVE

To develop and demonstrate the special equipment and methods required to optimize forage production on organic wetlands in the interior. All major activities including land clearing, water level control, cultivation and seeding and harvesting are being filmed for use at short courses, workshops and seminars.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1981-82			9,800
1982-83			4,800
1983-84			5,500

DESCRIPTION

Since the early development of the ranching industry in the Interior, organic wetlands provided grazing and a major source of winter feed; but, forage yields on organic wetlands are low. Water control measures can improve forage production on wetlands. These measures allow for draining in wet years and sub-irrigation and/or flooding in dry ones.

The application of fertilizer has shown that forage production on some native wetlands can be markedly increased. Fertilization and seeding to domestic forage crops such as Reed Canary Grass has increased forage yields substantially.

Development of wetland meadows has been hindered by a lack of commercially available equipment capable of working on unstable meadow soil.

Eric Reay's meadow is being used as a development and equipment demonstration site. Development has included topographical surveys, ditch improvement, water control structure construction and evaluation, and land clearing.

STATUS AND COMMENTS

Ditch improvements and land clearing were completed by summer 1982.

The cleared meadow was plowed, disced, and "floated" or levelled, in the fall of 1983. It was then seeded, using a Brillion Seeder and Reed Canary Grass.

Work for 1984 included ditch and main channel surveys and improvements, as well as initial development of a specialized plow for use on root-infested organic soils.

REPORTS

TITLE Soil And Water Management of Sphagnum Peat Soils for Carrot Production in New Brunswick.

CONTRACT # **COST**

ORGANIZATION Fredericton Research Station, Agriculture Canada.

PRINCIPAL INVESTIGATOR T. Lien Chow,
Agriculture Canada Research Station,
Box 20280,
Fredericton, N.B., E3B 4Z7.

DURATION 1980-On-going.

SPONSOR In House.

SCIENTIFIC AUTHORITY

OBJECTIVE

To develop improved soil and water management technologies for carrot production on sphagnum peat soil in New Brunswick.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

-Yield of carrot grown in organic soil of New Brunswick is 2/3 or lower if compared to that of Quebec and Ontario. The low yield, in part, is resulting from poor germination caused by inadequate soil moisture and thermal conditions. Compacting seed bed and/or rising ground water table are found to be effective in increasing germination.

-Detailed laboratory compactibility tests were conducted on cultivated peat materials. The tests show that at stress < 13 kPa, compactibility was relately unaffected by its moisture content. At higher stresses, the compactibility increased with increasing moisture content. The relationship may be expressed by a simple polynomial equation. In response to compaction, saturated hydraulic conductivity of peat reduced more than 1000-folds as bulk density increased from 0.1 to 0.25 gm/cm3. For this reason, compactive forces > 3 kPa are not recommended for seed bed preparation.

-Drainage experiments are being carried out on systematically tiled fields at 18, 30 and 37 m spacings.

-Fertility and variety experiments are also carried out by researchers of Herve J. Michaud Experimental Farm at Buctouche.

STATUS AND COMMENTS

REPORTS

Progress reports are available.

TITLE Development of a Peat Bog Cultivator and Root Crop Harvester-Transporter.

CONTRACT # 075Z.01843-9-0922 **COST** $152,052.00

ORGANIZATION Memorial University of Newfoundland,
Faculty of Engineering and Applied Sciences,
St. John's, Newfoundland, A1C 5S7.

PRINCIPAL INVESTIGATOR Dr. Allan Robb, (709) 737-8948.

DURATION July 19, 1979-July 19, 1980.

SPONSOR Agriculture Canada.

SCIENTIFIC AUTHORITY Mr. H.W.R. Chancey, Director,
Agriculture Canada Research Station,
P.O. Box 7098,
St. John's, Newfoundland.
A1E 3Y3 (709) 737-4619.

OBJECTIVE

To design, construct and further develop a row crop cultivator and a root crop harvester for specific requirements of vegetable production on peat soils in Newfoundland.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1979-80			$152,052.00

DESCRIPTION

1) The exact needs of the industry were determined through consultation with Agriculture Canada Researchers and Newfoundland Department of Agriculture Production planners.

2) A market search was made for available equipment in order to buy machines, components and mechanisms whenever possible.

3) Machines and components were assembled and constructed to suit the needs of the industry.

4) Purchased or rented equipment was tested and evaluated with necessary modifications made.

5) The equipment was then tested and developed as requires to finally assure design met design criteria.

6) The use of the equipment was compared to existing equipment.

STATUS AND COMMENTS

The Crop Sprayer, mounted on a light all-terrain vehicle has proven extremely effective in general weed control work on peat soils.

The Root Crop Harvester is in need of further modification of the pick up head, and redesign work awaits appointment of an In-House Engineer.

The Crop Transporter has been in use for several seasons and is better adapted for agricultural purposes than those obtained commercially.

REPORTS

Two copies of the design criteria were forwarded to the Scientific Authority as soon as criteria had been established.

Three copies of a final report were delivered to the Scientific Authority at the end of the twelve-month contract period.

TITLE Soils and Agricultural Capability Map of Holland Marsh

CONTRACT # **COST**

ORGANIZATION Ontario Ministry of Revenue,
Harvey Tasker.

PRINCIPAL INVESTIGATOR Elizabeth Snell,
RR 1
Cambridge, Ontario,
N1R 5S2.

DURATION April to June 1974.

SPONSOR In House.

SCIENTIFIC AUTHORITY Dr. Douglas W. Hoffman,
Director, School of Urban and Regional Planning,
University of Waterloo,
Waterloo, Ontario.

OBJECTIVE

To map the organic soils of Holland Marsh and to classify the soils for agricultural capability as a data base for fair tax assessment.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1974-75			

DESCRIPTION

A map of the organic soils series was intensively surveyed on a 100 m. grid, and a map of the Agricultural Capability was surveyed on a 100 m. grid.

STATUS AND COMMENTS

Basis of tax assessment revision upheld by Ontario Municipal Board decision.

REPORTS

TITLE The Development and Evaluation of Forage Harvesting and Storage Systems for Use on Peat Soils.

ORGANIZATION Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland. A1E 3Y3

PRINCIPAL INVESTIGATOR A.F. Rayment.

DURATION 1972 - present.

SCIENTIFIC AUTHORITY Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland. A1E 3Y3

OBJECTIVE

Through machinery modification and development and field evaluations, to produce a reliable and energy-efficient system for forage crop harvesting and storage on peat soils.

DESCRIPTION

A moderately priced line of equipment is needed for use on peat soils by the small farmer. At present we are testing a European flail-type forage harvester modified for use on peat soil, to be used as both mower and pick-up to form stacks in a specially designed forage trailer for peat soils. This equipment is readily handled by a 30-33 kw (40.2-44.6 hp) tractor fitted with 1/2 tracks and has been used to produce both hay and silage.

STATUS AND COMMENTS

Due to the support provided by a grass sod on peat, a wheeled tractor fitted with 1/2 tracks has been found an ideal power unit for forage harvesting on the wet peats of Colinet and St. Shotts. The light European flail harvester was very adequately supported by refitting with extra wide rims and tires. A specially designed trailer, with very low clearance, but fitted with skids in case of sinking, has been found quite workable as a forage trailer and stacker. The machine has been field tested for one season and requires at least two more before conclusions can be drawn.

REPORTS

Rayment, A.F. and R.T. Bailey. 1983. Peatland Forage and general purpose trailer. Peat News 5(4): 17-20.

TITLE Forage and Cereal Cultivar Testing.

ORGANIZATION Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland. A1E 3Y3

PRINCIPAL INVESTIGATOR A.F. Rayment.

DURATION 1957 to present.

SCIENTIFIC AUTHORITY Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland. A1E 3Y3

OBJECTIVE

To evaluate new forage and cereal cultivars available for outside sources.

DESCRIPTION

Perennial cultivars are seeded in randomized blocks of small plot comparison, replicated four times. Varieties are evaluated on yielding ability, longevity (winter survival) and other desirous characteristics.

STATUS AND COMMENTS

Of particular value for peat soils are the species of known water tolerance, such as reed canarygrass, the fescues, timothy and red clover. For the more sensitive species, such as orchardgrass and alfalfa, the peat soil is a medium for selecting more tolerant cultivars, which in turn may be useful as indicator crops to drainage treatment differences.

REPORTS

1) Choo, T.M., J.E. Langille, A.F. Rayment, J.S. Bubar, R.B. Walton and N.N. Coulson. 1984. Cultivar-environment interactions in red clover. Can. J. Plant Sci. 64:139-144.

4.6.8 IN SITU USE JAC 28/8/84

TITLE Peat Fertilization and Managemant for Crop Production in Newfoundland.

ORGANIZATION Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland.
A1E 3Y3

PRINCIPAL INVESTIGATOR A.F. Rayment.

DURATION 1957 to present; revised 1966, 1983.

SPONSOR

SCIENTIFIC AUTHORITY Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Hewfoundland.
A1E 3Y3

OBJECTIVE

To determine the fertilizer and soil amendment inputs required to produce forage and fodder root crops on Newfoundland peat soils, and to relate these to soil test calibration.

DESCRIPTION

a) Response of established stands of grass to different rates of nitrogen, phosphorous and potassium fertilizers in factorial combinations with soil samples taken appropriate to a soil test calibration.

b) Influence of Cu-Mo fertilizer rates in factorial combinations on Cu/Mo ratios in grass and legume crop materials.

c) Animal response to established Cu/Mo ratios in the forage.

STATUS AND COMMENTS

a) Final establishment of N x K interaction commenced in current year, with two more test years anticipated.

b) Chemical analysis (Cu & Mo) of tissue collected in final year of experiment in process of analysis.

c) Preliminary animal response data expected in next year.

REPORTS

1) Rayment, A.F. 1965. Fertilizing peat soils for forage crops crops in Newfoundland. Research for Farmers 10(2): 12-13.

2) Rayment, A.F. 1971. Alfalfa potential on peat soils. Canadex 120.822.1.

3) Rayment, A.F. and P.K. Heringa. 1972. The influence of initial and maintenance fertilizers on the growth and ecology of grass-clover mixtures on a Newfoundland peat soil. Proc. 4th Int. Peat Congr., Helsinki. 3:111-120.

4) Rayment, A.F., P.K. Heringa and R.J. Traverse. 1975. The interactions of drainage, limestone rates and phosphorous sources and rates in their effects on the yield of carrot and rutebaga in greenhouse lysimeter cultures and field studies on a Newfoundland peat soil. Proc. Int. Symp. Peat in Agr. and Hort. Israel publ. 205:85-97.

5) Mathur, S.P. and A.F. Rayment. 1977. Influence of trace element fertilization on the decomposition rate and phosphatase activity of a mesic fibrisol. Can J. Soil Sci. 57:397-408.

6) Rayment, A.F. and Gupta, U.C. 1984. Copper-molybdenum fertilizing of sheep pasture on Newfoundland peat soils. Proc. 7th Int. Peat Congr., Dublin. 511-521.

TITLE Vegetable Production on Peat Soil.

ORGANIZATION Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland.
A1E 3Y3

PRINCIPAL INVESTIGATOR B.G. Penney.

DURATION 1957 to present.

SPONSOR

SCIENTIFIC AUTHORITY Agriculture Canada,
Research Station,
P.O. Box 7098,
St. John's, Newfoundland.
A1E 3Y3

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OBJECTIVE

To develop technology which will improve vegetable production on peat soil.

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DESCRIPTION

The effect of nitrogen source on carrots grown on peat soils is presently being studied.

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STATUS AND COMMENTS

Research prior to 1983 consisted mainly of: (1) cultivar evaluations; (2) limited fertility studies with late cabbage and cauliflower and (3) some weed control work. Future research will include further fertility studies and control of weeds, particularly grasses.

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REPORTS

- Olsen, O.A. Vegetable Adaptation Trials on Peat Bogland at Colinet, Newfoundland. The Canadian Horticultural Council Report, 1958. Page 77.
- Olsen, O.A. Vegetable Production on Peat Bogland. TCHCR, 1959. Page 31-32.
- Olsen, O.A. Trace Element Amendments on Mineral and Peat Soils. TCHCR, 1960. Page 22-23.
- Rosa, N. Mulching with Polyethylene on Peat Soil. TCHCR, 1962. Page 21.
- Penney, B.G. Celery Yields - Mineral Soil vs. Peat. TCHCR, 1966. Page 10.
- Penney, B.G. Weed Control in Carrots. National Weed Committee Research Report, 1966. Page 145.
- Penney, B.G. and A.F. Rayment. The Effect of Fertilizer on Late Cabbage Yields, TCHCR, 1970. Page 11.
- Penney, B.G., A.F. Rayment and P.K. Heringa. Late Cabbage Fertility Trial (Peat Soil). TCHCR, 1971. Page 3.
- Penney, b.G., A,F, Rayment and P.K. Heringa. Late Cabbage Fertility Trial (Peat Soil). TCHCR, 1972. Page 3.
- Penney, B.G. Grass Control on Peat Soil with Post-Emergence Applications of Glyphosate. TCHCR, 1975. Page 3.
- Penney, B.G. Effect of NPK Fertilizer on Cauliflower Yields. TCHCR, 1976. Page 4.
- Penney, B.G. and A.F. Rayment. Evaluation of Carrot Varieties Grown on Peat Soil for Susceptibility to "Sunburn" TCHCR, 1977. Page 1.
- Penney, B.G. and A.F. Rayment. The Effect of Ridging on Yield and Root Length of Carrots Grown on Ridged and Unridged Rows. TCHCR, 1982. Page 3-4.
- Penney, B.G. Weed Control in Carrots. National Weed Committee Research Report, 1968. Page 165.
- Penney, B.G. Weed Cootrol in Carrots. Canada Weed Committee Research Report, 1971. Page 133.
- Penney, B.G. Weed Control in Carrots. Canada Weed Committee Research Report, 1972. Page 89.
- Penney, B.G. Weed Control on Peat Soil with Glyphosate. Canada Weed Committee Research Report, 1974. Page 344.

TECHNICAL AND ECONOMIC STUDIES

The assessment of existing and developing technology and its potential to transfer to Canadian social and economic environments is a significant component of this program.

TITLE Potential Demand for Peat.

CONTRACT # **COST** approx. $50,000.

ORGANIZATION Monenco Ontario Ltd.,
2 St. Clair Avenue East,
Toronto, Ontario.
M4T 2T5

PRINCIPAL INVESTIGATOR D.H. Stevenson; (416) 961-4590.

DURATION Dec.1982 to May 1983.

SPONSOR Ontario Ministry of Energy.

SCIENTIFIC AUTHORITY Earle W. Stobart, P. Eng.,
Ontario Ministry of Energy,
56 Wellesley Street West,
Toronto, Ontario.
M7A 2B7

OBJECTIVE

To determine the potential market for peat as a substitution fuel.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	Ont. Gov't		$50,000.

DESCRIPTION

A preliminary estimate of the potential demand for fuel peat in the province of Ontario as a result of information collected through a literature review, a telephone survey and field visits to selected industrial plants.

Four industrial areas were identified where peat had the potential for uses as a fuel, they are:

- pulp and paper
- cement
- smelting and refining
- iron ore mills

Nine major regions of Ontario were surveyed and the potential demand for peat in each was estimated.

STATUS AND COMMENTS

REPORTS

Two volumes were produced.

Volume 1 - addressed the question of the potential demand;

Volume 2 - reviews the methodology.

TITLE Eskasoni Indian Reserve #3 - Bras Dor Lakes, N.S.

CONTRACT # **COST** $120,000.

ORGANIZATION Morton and Partners Ltd.,
Consulting Engineers and Engineering Geologists,
215 Carlingview Drive,
Rexdale, Ontario,
M9W 5X8

PRINCIPAL INVESTIGATOR J.D. Morton (416) 675-1440

DURATION Aggregate (including research elements) approx. 9 mo. during 1982-84

SPONSOR Dept. of Indian and Northern Affairs (DIAND) and Canada Employment and Immigration (CEI)

SCIENTIFIC AUTHORITY Jean Luc Blais, Minerals Directorate (East)
Reserves and Trusts Directorate,
Dept. of Indian and Northern Affairs,
1 Front Street West, Suite 302,
Toronto, Ontario,
M5J 1A4 (416) 369-4615

OBJECTIVE

To establish peat reserves and define their usability for energy, horticultural, chemical or other purposes; to develop a conceptual plan for economical extraction; to prepare Prefeasibility and Feasibility Reports; to conduct appropriate Market and Financial Research and prepare Economic, Social and Environmental Impact Statements.

FUNDING

Fiscal Year	Sponsor	Contractor		Total
	DIAND		CEI	
1982	14,500		12,000	26,500
1983	17,000			17,000
1983-84			8,500	8,500
1984	69,000			69,000

DESCRIPTION

Three large upland peat bogs were explored and sampled and the recoverable reserves of horticultural and other grades of peat were defined and quantified.

A conceptual plan for access and development was prepared and appropriate market, financial and budget cost estimate studies performed.

A full development and master plan was thereafter drawn up and presented to the Client for consideration.

STATUS AND COMMENTS

The project is presently undergoing financing studies preparatory to formation of an appropriate corporate body to develop the resource.

REPORTS

An Inventory of Peat Resources, Eskasoni (1982)

Prefeasibility Analysis and Development Strategy of Peat Resources, Eskasoni (1983)

A Report on the Feasibility and Structure of a Horticultural Peat Industry, Ekasoni (1984)

TITLE Remote Biomass Energy Assessment Study

CONTRACT # 694-8525 **COST** $95,000.

ORGANIZATION Bird & Hale,

PRINCIPAL INVESTIGATOR

DURATION September 1983 - September 1984

SPONSOR Energy Mines and Resources (EMR), and Ontario Ministry of Energy (OME).

SCIENTIFIC AUTHORITY Scott Stevens, Project Leader,
Alternative and Renewable Energy Branch,
Ontario Ministry of Energy,
Queen's Park,
Toronto, Ontario,
M7A 2B7 (416) 965-8060

OBJECTIVE

To identify the six remote communities in Ontario which possess the best opportunity for the viable installation of a biomass/electric energy system.

FUNDING

Fiscal Year	Sponsor	Contractor		Total
	OME		EMR	
1983-84	40,000		15,000	$55,000
1984-85	35,000		10,000	$45,000

DESCRIPTION

The project consists of the following tasks:

1) Undertake a preliminary assessment of the biomass energy resources (peat and wood) of all 44 remote communities in Ontario.

2) Priorize all communities with respect to the availability and cost of biomass and the social implications of operating a biomass/electric energy system to displace diesel generators.

3) Select the six communitites which present the best opportunity for installation of a system.

4) Undertake a detailed biomass assessment of the best four communities from above number six. Report on the methods of harvesting, cost of harvesting and transportation, and total quantity required to operate a biomass/electric energy system in these four communities.

STATUS AND COMMENTS

Phase I report (identification and preliminary assessment of the six most suitable communities) was complete in June 1984. The final report (identification of exact cost and method of harvesting of the four most appropriate communitites) will be available by September 15, 1984.

REPORTS

TITLE Feasibility of a Fuel Peat Demonstration Project in Southern Nova Scotia.

CONTRACT # **COST** $70,000.

ORGANIZATION Technopeat Inc.
881 Boulevard Harwood
Dorion, Québec.

PRINCIPAL INVESTIGATOR

DURATION 6 months

SPONSOR Canada - Nova Scotia Oil Substitution and Conservation Agreement

SCIENTIFIC AUTHORITY Alexander R. Anderson, Biologist,
Nova Scotia Dept. of Mines and Energy,
P. O. Box 1087,
Halifax, N. S.
B3J 2T3 (902) 424-4575

OBJECTIVE

Investigate the economics of utilizing indigenous peat reserves to displace oil in the industrial sector of southern Nova Scotia.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984			

DESCRIPTION

In 3 parts the study will provide information on:

1.a) Reserves and Potential Users;

b) Design a tentative bog development and production plan;

c) Design a tentative environmental testing and monitoring program;

d) Cost summary of production and utilization as compared to oil;

e) Socio-economic impacts.

2.a) Presentation of potential environmental impacts including:

i - effect on local water table;
ii -impact on flora and fauna;
iii -rehabilitation of the exhausted deposit.

3. Basic information on the production, utilization, and transportation of peat fuels.

STATUS AND COMMENTS

Nearing Completion.

REPORTS

TITLE Feasibility of Fuel Peat Production and Utilization at Hay River and Yellowknife, NWT

CONTRIBUTION # RC11-011 **COST** $22,550

RECIPIENT ORGANIZATION Northwest Territories Association of Municipalities (NWTAM),

PRINCIPAL INVESTIGATOR Mr. John Radforth, (705) 645-9563,
Peat Consultants, Canada Ltd.
Box 248, Bracebridge, Ont. P0B 1C0

DURATION December 1983 - September 1984.

SPONSOR EMR Remote Community Demonstration Program (Now under EMR ENERDEMO) and Northwest Territories Association of Municipalities (NWTAM)

SCIENTIFIC AUTHORITY Elliot Rodger, Manager - RCDP
Renewable Energy Division,
Energy Mines and Resources Canada,
580 Booth Street,
Ottawa, Ontario,
K1A 0E4 (613) 995-9447

OBJECTIVE

To look at peat deposits near Yellowknife and Hay River, NWT, making a preliminary assessment of volume and quality.
To relate analysis of resource available to potential use.
To examine available machinery and equipment for peat mining, especially with consideration of the problems of permafrost.

FUNDING

Fiscal Year	Sponsor		Total
	ENERDEMO	NWTAM	
1984-85	21,500.00	1,050.00	22,550.00

DESCRIPTION

Conclusions of the interim report based on the first two stages of the study indicate that fuel peat production is likely more feasible near Hay River than near Yellowknife. Peat depth and quality in bogs near Hay River appear acceptable, but are subject to confirmation by reconnaissance and detailed survey. It is estimated that a "small commercial" peat production system could be capable of supplying sufficient fuel peat for municipal water heating and/or the hospital in Hay River. It is further estimated that a full-size industrial peat production system could supply sufficient fuel peat in Hay River for shipment to Yellowknife (and other communities) at a price that would offer savings to the consumer. However, experimental confirmation of peat production machinery operation and peat-drying schedules in the presence of permafrost needs to be carried out. Price of fuel peat would be dependent on economies of scale associated with mining.

STATUS AND COMMENTS

The third and final phase of the study should be completed and available to NWTAM and EMR by late 1984. This phase is intended to compare the estimated fuel cost savings from using sod peat instead of diesel fuel in relation to the owning and operating cost of peat-burning equipment. Recommendations for further action will depend on the findings of this phase.

REPORTS

Submitted to EMR and NWTAM after completion.

TITLE An Examination of Alternative Sources of Energy for Deschambault Lake, Saskatchewan

CONTRIBUTION # RL08-007 **COST** $40,000. (approx.)

RECIPIENT ORGANIZATION Deschambault Lake Local Advisory Council,

PRINCIPAL INVESTIGATOR J.J. Bell, (306) 425-2056
Bell, Ahenakew, and Associates, Box 228.
La Ronge, Sask. S0J 1L0
& Monenco.

DURATION November 1983 - April 1984.

SPONSOR EMR Remote Community Demonstration Program (now under EMR ENERDEMO)

SCIENTIFIC AUTHORITY Elliot Rodger, Manager - RCDP
Renewable Energy Division,
460 O'Connor St., Room 609,
Energy Mines and Resources,
Ottawa, Ontario,
K1A 0E4 (613) 995-9447

OBJECTIVE

Local Deschambault Lake residents are concerned about the high costs of energy. Total costs of power generation by 250 kW diesel are currently (1982) $0.21 /kwh. An analysis of energy demand by 1995 for the area was carried out. Several energy options are considered in this study, including: a possible grid extension; mini-hydro; and various configurations using wood and peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1984-85	40,000.00		40,000.00

DESCRIPTION

Electrical consumption of 900 MWh during 1982 is expected to increase to about 2,000 MWh by 1995, assuming factors such as population increase, new housing stock, light industry needs, etc. North Sask. Electric estimates that this increase will be more than doubled if the rate schedule is changed to the provincial norm (now applicable only to customer consumption under 315 kwh/mo.).

Preliminary examination of wood resources shows that there appears to be a sufficient supply of wood within a reasonable radius of the village to supply a central energy plant. Costs of harvesting have been determined very approximately to range from about $22/oven-dried ton (ODT) for a fully mechanized operation to about $100 /ODTD for a saw and skidder operation.

Brief reconnaissance survey of peatlands in the area was carried out. 8 sites were visited. The peatlands are large. In particular, one is 2,000 ha. of which about 1,000 ha. has an average depth of 1.5 m. Estimated potential mineable resource from this deposit is about 1.7 million tonnes, air-dried to 35% moisture content. Calorific value of a sample taken from this deposit was 8740 Btu/lb (0% moisture content), standard fuel quality peat.

Preliminary estimate is that conventional peat mining is possible climatically at Deschambault Lake. Further work on meteorological aspects will be required to more accurately assess yields in terms of tonnes of air-dried run-of-mine fuel peat product. Indications are stated to be that at least one cycle is possible and likely two in most years. Peat mining costs for a 5100 tonne/yr. operation were determined to be $52/tonne delivered to the plant with cost decreases to $35/tonne for a 10,000 tonne/yr. operation.

A peat-fired steam engine/generator at 250 kW capacity is expected to cost $0.67/kwh. At the 500 kW level, the peat-fired costs were $0.48/kwh for 2 x 250 units or $0.43/kwh for a single 500 kW unit. Diesel costs at 500 kW were unavailable. Socio-economic benefits of a peat-fired facility in terms of local employment and displacement of imported oil, plus potential utilization of waste heat produced, need further examination.

Brief examination of the local potential for mini-hydro indicates some potential. A combination of the peat-fired system, with the use of mini-hydro for peaking, is said to represent another alternative for further investigation.

STATUS AND COMMENTS

Report due Fall, 1984. In general, report concludes that further analysis is required to select the "best" energy option for Deschambault Lake.

TITLE Peat Energy Feasibility Study, Cat Lake, Ontario.

CONTRIBUTION # RC06-002 **COST** $55,000.

RECIPIENT ORGANIZATION Cat Lake Band

PRINCIPAL INVESTIGATOR L.J. Rak, P. Eng., (416) 675-0160
Rak Engineering Ltd.,
117 Disco Rd.,
Rexdale, Ont.,
M9W 1M3;
- Maunder & Britnell Engineering Ltd.;
- IEC Beak Consultants;
- ADI Ltd., 1115 Regent St.,
Fredericton, N.B.,
E3B 4Y2

DURATION December 1983 - October 1984.

SPONSOR EMR Remote Community Demonstration Program (now EMR ENERDEMO), Dept. of Indian Affairs and Northern Development (DIAND) and Ontario Ministry of Energy (OME)

SCIENTIFIC AUTHORITY Elliot Rodger, Manager - RCDP,
Renewable Energy Division,
580 Booth Street,
Energy Mines and Resources,
Ottawa, Ontario, Canada.
K1A 0E4 (613) 995-9447

OBJECTIVE

To asses the energy needs of the Cat Lake Indian Community, evaluate the peat resource base and to determine whether it is technically and economically feasible to meet the community energy needs by a Peat Energy Conversion Centre (PECC).

FUNDING

Fiscal Year	Sponsors			Total
	RCDP	DIAND	OME	
1984-85	25,000.00	16,250.00	13,750.00	55,000

DESCRIPTION

The work carried out in this study could be subdivided into four major study areas:

1) community and resource base assessment;
2) technical feasibility study;
3) definition of social and environmental concerns, &
4) financial and economic analysis.

Total annual peat requirements to increase energy consumed from 20 AMP house service in 1985 estimated at 580 MWh to 100 AMP house service in 2000 of 1,730 MWh, is predicted to be 6,800 tonnes in 1990 and about 8,500 tonnes by 2000.

Evaluated peat resource base, located within 10 km of the community is in the range of 1.5 to 2.0 x 106 tonnes of fuel grade peat. It was concluded that only a portion of these deposits would be utilized to meet the projected community energy needs.

Estimated capital cost for the proposed peat harvesting facility is in the order of $950,000, with annual operating costs of about $100,000. Cost of peat delivered to the PECC varies from about $35/tonne at start up to $20/tonne by the year 2000.

Environmental and social impacts resulting from the interaction between the proposed activities of the Cat Lake peat development and the social environmental components have been assessed in generic terms. The study notes that some of the changes the proposed development will bring are considered beneficial, others unfavourable. Economic analysis of the recommended energy systems and various sub-system scenarios has been carried out. The options were financially evaluated on the basis of a single government body being responsible for providing, maintaining and operating each complete facility.

The results of the technical studies indicated that there were several energy system alternatives to meet the community energy needs. The leading candidates were: a diesel generating system located in the community, connection to Ontario Hydro Grid, and a PECC. It was concluded that a peat-fired boiler and steam engine generator system, using proven technology, is entirely feasible, (and actually superior for the 100 AMP scenario). Estimated average annual cost per kWh is $0.42 in the year 2000, 36% of projected diesel generator costs. For the milestone years of 1990 and 2000 respectively, the estimated annual income flows into the community would be $543,000 and $1,212,000 if the PECC is implemented.

It was concluded that the Cat Lake Community should utilize the local peat resource base and the available technology to substantially improve the quality of life on the reserve.

STATUS AND COMMENTS

Final Report due Fall 1984, available CISTI Energy Library.

TITLE Peat Industry Survey.

CONTRACT # EMR - in-house **COST**

ORGANIZATION Mineral Census - Information Systems Division,
Mineral Policy Sector,
Energy, Mines and Resources.

PRINCIPAL INVESTIGATOR John T. Brennan and Michel Prud'homme.

DURATION Annual survey of producers by questionnaires.

SPONSOR EMR and some provinces.

SCIENTIFIC AUTHORITY John Brennan, Director,
Information Systems Division,
Mineral Census Section,
Resource Supply and Information Branch,
Mineral Policy Sector,
Energy, Mines and Resources,
580 Booth Street,
Ottawa, Ontario.
K1A 0E4
(613) 995-9466.

OBJECTIVE

To report statistics for businesses primarily engaged in the extraction of Peat. For statistical purposes, the report contains statistics which the Standard Industrial Classification manual, 1970 (Catalogue 12-501) designates as industry 072: establishments primarily engaged in the extraction of peat.

FUNDING

Fiscal Year	Sponsor	Contractor	Total

DESCRIPTION

Tables listed in this report are: Principal Economic Statistics, Employment & Payroll, Production & Related Workers, Purchased Fuel & Electricity Used, Materials & Supplies, Value of Production Shipment of Peat by Province, Producers' Shipments of Peat (see #), Export of Peat (see #), and List of Establishments classified to this industry. In 1983, $53 million of peat was shipped by Canadian producers. This compares with $22 million in 1975.

Statistics are prepared on the basis of questionnaires sent annually to all peat producing companies in Canada. The elementary questionnaire requests information on fuel, fertilizer, vermiculite, plastic bags, other costs, inventories of fuel & package peat.

# over ten year period.

STATUS AND COMMENTS

Originally this work was done at Statistics Canada but was transferred to EMR Mineral Policy to facilitate their access to the Statistics. Reports are still published by Statistics Canada.
Michel Frud'homme, (EMR Industrial Minerals Division: (613) 995-9466 ext. 217) has been designated to take responsibility for peat as an industrial mineral.

REPORTS

Order reports from Statistics Canada (quote numbers listed):

- Peat Industry 1976, 8pp., $0.70	#26:212
- Peat Industry 1977, 8pp., $0.70	
- Non-Metal Mines, 1978	#26:224
- Non-Metal Mines, 1979	
- Non-Metal Mines, 1980	
- Non-Metal Mines, 1981	
- Canada's Mineral Production, 1979	#26:202
- Canada's Mineral Production, 1980	#26:202
- Canada's Mineral Production, 1981	#26:202
- Canada's Mineral Production, 1982	#26:202
- Canada's Mineral Production, 1983	#26:202
- General Review of the Mineral Industries, 1979 (see #)	#26:201
- General Review of the Mineral Industries, 1980	#26:201
- General Review of the Mineral Industries, 1981	#26:201

contains figures for production value & tonnage only.

TITLE Bioenergy Projects: Potential, Classification, and Implementation Logistics Study for Eastern Canada.

CONTRACT # DSS File: 14 SQ FIRE 7-C-0 **COST** $46,089.20

ORGANIZATION Roche Associates Ltd.,
Forest and Wood Products Department,
2535 boul. Laurier,
Ste-Foy, Québec.
G1V 4M3

PRINCIPAL INVESTIGATOR J.L. Kirouac

DURATION 1982-83

SPONSOR EMR

SCIENTIFIC AUTHORITY Mr. Subhash C. Junéja,
Energy Mines and Resources,
580 Booth Street,
Ottawa, Ontario.
K1A 0E4 (613) 995-9447 ext. 283.

OBJECTIVE

To collect data on the geographic distribution of fuel biomass resources. Forest biomass, agricultural waste and peat are considered as potential fuel biomass resources. Data is being gathered for all parts of Eastern Canada. Objective criteria will be used to select potential sites for which capital costs will be estimated.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1982-83	46,089.20		$46,089.20

DESCRIPTION

Biomass considered in the study for bio-energy considers: forestry residues, unutilized allowable cut and energy plantations; agricultural cover-crop residues, culls residue, processing plant wastes and municipal wastes. Finally the study considers peat resources.

Method of study consists of collecting data for the elaboration of tables and synthesis maps to show the characteristics of various regions, the locations of biomass production and rates of its consumption.

STATUS AND COMMENTS

The study is completed and a report is available from the contractor. It consists of one main volume and three annexes (including one set of maps).

REPORTS

TITLE Etude sur l'état, les intervenants et les besoins de la recherche minérale dans l'Est du Québec.
(Study on the state, the operations and the needs of mineral research in Eastern Quebec).

CONTRACT # **COST** $24,600.

ORGANIZATION B.R.I.T.E.Q. (Bureau de recherche sur l'industrie de la tourbe dans l'est du Québec)
90,rue Frontenac,
Rivière-du-Loup, Québec.
G5R 4L9

PRINCIPAL INVESTIGATOR Jacques Dubé and Marie Pelletier.

DURATION 26 March 1984 to 30 June 1984.

SPONSOR Centre de recherches minérales (CRM) du ministére de l'Energie et des Ressources (MER) du Québec.

SCIENTIFIC AUTHORITY Dr. Gilles Barbery,
Dépt. Mines et métallurgie,
Cité Universitaire,
Ste-Foy, Québec.
G1K 7P4 (418) 656-2555.

OBJECTIVE

To characterize mineral research in eastern Québec, identify accumulated experience and/or knowledge gaps and propose an R&D strategy likely to foster the development and diversification of the mineral industry in this region.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1983-84	$24,600.		$24,600.

DESCRIPTION

1. Evaluation of mineral resources in the soil and sub-soil in the eastern Québec area (excluding petroleum, natural gas and salt) in order to establish actual regional potential of exploited mineral substances in the territory and to identify the resources liable to be worked in the short and mid-terms.

2. Identification of principle operations in the region that are working in peat related R&D by clarifying their respective fields of interest.

3. Evaluation of general organisation of research work on peat conducted by various principle Canadian and foreign organisations.

4. Establishment of a comparative assessment of the state of the regional situation of research on peat and of the industry exploiting this mineral resource.

5. Identification of research projects or studies and their means of support, to be initiated or carried on in the region to benefit the concerned sectors, including their conditions for success, possible applications and potential importance.

STATUS AND COMMENTS

REPORTS

Study completed and report submitted to the C.R.M. (Centre de recherches minérales).

TITLE Assessment of Peat as an Alternative Fuel for Power Generation.

CONTRACT # 18SQ.23440-6-9065 **COST** $29,999.38

ORGANIZATION Montreal Engineering Company Ltd.,
(Monenco) 2045 Stanley Street,
P.O. Box 6088,
Station A,
Montreal, Québec.
H3C 3Z8

PRINCIPAL INVESTIGATOR A. Ismail, P. Eng.; (416) 688-4263.

DURATION 16 December 1976 - 31 March 1977.

SPONSOR Energy, Mines and Resources.

SCIENTIFIC AUTHORITY T.E. Tibbetts,
N.R.C. Atlantic Research Labs.,
1411 Oxford Street,
Halifax, N. S.
B3H 3Z1 (902) 426-7532.

OBJECTIVE

To review existing data on peat reserves, assess techniques of extracting, and utilization of peat, identify and prepare recommendations for areas of future study including extraction, processing, utilization, environmental impact and potential contribution of peat for power generation.

FUNDING

Fiscal Year	Sponsor	Contractor	Total
1976-77	EMR	Monenco	$29,999.

DESCRIPTION

Work was scheduled for completion in two phases:

I. Assessment of Resources
  a) Select key references from Geoscience Data Index, GEO.REF and compendex.
  b) Obtain copies of selected copies by mail or by visits to the library.
  c) Draw up nationwide summary of peat resources.
  d) Outline alternative schemes for exploitation (eg. size and location of plant).
  e) Identify and recommend for detailed study, deposits of major significance.

II. Assessment of Technology and its Application
  a) Visit to Irish and Russian utilities for background information on existing plants.
  b) Explore alternative schemes for extraction, processing, and burning peat using conventional technology.
  c) Contact research groups working on advanced combustion processes.
  d) Explore alternative schemes for peat burning using advanced processes.
  e) Prepare preliminary scheme (s) for exploitation of peat using conventional technology.
  f) Identify areas of hardware development which might lead to improved efficiency of peat utilization.
  g) Identify and prepare recommendations for areas of future study, including both the technology of exploitation of peat and its application in Canada.

STATUS AND COMMENTS

Summary of peat resources is somewhat dated.

REPORTS

Assessment of Canadian Peat as an Alternative Fuel for Power Generation. Report available from Micromedia Ltd., 144 Front Street West, Toronto, Ontario. M5S 2L7

TITLE The Manufacture of High Value-Added Products from Peat.

CONTRACT # **COST** $14,400

ORGANIZATION Frank Maine Consulting Ltd.,
71 Sherwood Drive,
Guelph, Ontario,
N1E 6E6

PRINCIPAL INVESTIGATOR Dr. Eileen Mason (519) 823-1465

DURATION July 1, 1982 to October 31, 1982.

SPONSOR Ministry of Northern Affairs, Ontario

SCIENTIFIC AUTHORITY Hans von Cube,
Strategic Planning Secretariat,
Ministry of Northern Affairs,
10 Wellesley Avenue East, 9th Floor,
Toronto, Ontario.
M4Y 1G2 (416) 965-1669

OBJECTIVE

To identify the ways in which peat could be utilized to give high value-added products.

DESCRIPTION

Various possible high value-added products that could be made from peat, such as, building products, fertilizer, and chemicals, are being evaluated as to the economics and technical problems to be resolved prior to commercialization justification.

STATUS AND COMMENTS

Project completed December 1982. The first of the follow-up projects has been funded and is underway.

REPORTS

"A Study to Investigate the Manufacture of High Value-Added Products from Peat" December 1982.
(On file at office of Strategic Planning Secretariat).

PEAT COMMERCIAL SERVICE/TECHNOLOGY VENDORS

The National Research Council of Canada takes no responsibility for the following listings of commercial service and technology vendors. Neither does the following listing indicate NRC endorsement or support for the services or products described. The following listings simply constitute the response of a variety of individuals, companies, and organizations to an invitation to fill in a standard form describing their services/products. Some Non-Commercial organizations are listed because they asked to be and because they have made significant contributions in peat related research. Such Non-Commercial entries are so noted. In many cases there are those who have made significant contributions to peat research in Canada but who will only be found in the bibliography or project data sheets. Here, as elsewhere, the intent is to bring together, and to try to categorize in one place, peat-related Canadian expertise and interest.

COMMERCIAL VENDORS FORM

COMPANY NAME ADI Limited.

ADDRESS 1115 Regent Street,
Fredericton, N.B.
E3B 4Y2

PHONE (506) 452-9000

TELEX 014-46244

ADDITIONAL OFFICES Ottawa, Ont.; Saint John, N.B.; Moncton, N. B.; Halifax, N. S.

CONTACT PERSON Mr. John R. Dean.

SERVICES

SURVEYING	(X)	ENGINEERING	(X)
PROTOTYPE DESIGN	(X)	LAB RESEARCH	(X)
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER ...Treatment of waste products.................. (X)

COMPETENCE

AGRICULTURE	( )	ECOLOGY	( )	MARKETING	(X)
BOTANY	( )	FORESTRY	( )	MINING	(X)
CHEMISTRY	( )	GEOLOGY	(X)	TRANSPORT	(X)
COMBUSTION	(X)	HYDROLOGY	(X)	VEHICLES	( )
DEWATERING	(X)	INVENTORY	( )		

OTHER......Waste treatment systems/biogas.................(X)

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?.....5....YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK..4....

PROVINCES OF CANADA EXPERIENCED WITH BC ( ) ALTA ( )
SASK ( ) MAN ( )
ONT ( ) QUE ( ) NB (X) NS ( ) PEI ( ) NFLD ( )
NWT ( ) YK ( ) **OTHER COUNTRIES** ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

Design of Peat-Fired Boiler in Lameque, N. B.;
Study of Biogasification of Peat;
Laboratory Study of Anaerobic Fermentation of Peat Pressate (Wet Carbonization) for Methane Production.

COMMERCIAL VENDORS FORM

COMPANY NAME C.I.L. Inc.; Plastics Division.

ADDRESS 2900 J.B. Deschamps,
Lachine, Québec
H8T 1C8

PHONE (514) 636-9230

TELEX 05-822598

ADDITIONAL OFFICES Brampton, Ont.; Edmonton, Alta.; Vancouver, B.C.

CONTACT PERSON James D. Kidd.

……

SERVICES

SURVEYING ( )
PROTOTYPE DESIGN ( )
PRODUCTION (X)
ENGINEERING ( )
LAB RESEARCH ( )
COMPUTER ANALYSIS ( )
OTHER ...Manufacture of polyethylene peat moss bags... (X)

COMPETENCE

AGRICULTURE ( )
BOTANY ( )
CHEMISTRY (X)
COMBUSTION ( )
DEWATERING ( )
ECOLOGY ( )
FORESTRY ( )
GEOLOGY ( )
HYDROLOGY ( )
INVENTORY ( )
MARKETING (X)
MINING ( )
TRANSPORT ( )
VEHICLES ( )
OTHER..( )

……

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?....15**....YEARS**

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK.......

PROVINCES OF CANADA EXPERIENCED WITH

BC (X) ALTA (X)
SASK ( ) MAN ( )
ONT (X) QUE (X) NB (X) NS (X) PEI (X) NFLD (X)
NWT ( ) YK ( ) **OTHER COUNTRIES** ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

Supplier of peat moss bags to all major peat moss producers and importers.

……

COMMERCIAL VENDORS FORM

COMPANY NAME Dalcor Machineries Inc.

ADDRESS 95 Montmagny Street,
St Bruno, Québec
J3V 1A3

PHONE (514) 461-2637
(514) 653-3802

TELEX

ADDITIONAL OFFICES

CONTACT PERSON André Corbeil

SERVICES

SURVEYING	( )	ENGINEERING	( )
PROTOTYPE DESIGN	( )	LAB RESEARCH	( )
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER ...Peat Packaging Machinery..................... (X)

COMPETENCE

AGRICULTURE	( )	ECOLOGY	( )	MARKETING	( )
BOTANY	( )	FORESTRY	( )	MINING	( )
CHEMISTRY	( )	GEOLOGY	( )	TRANSPORT	( )
COMBUSTION	( )	HYDROLOGY	( )	VEHICLES	( )
DEWATERING	( )	INVENTORY	( )		

OTHER...( )

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?..........YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK..2....

PROVINCES OF CANADA EXPERIENCED WITH BC ( ) ALTA (X)
SASK (X) MAN (X)
ONT (X) QUE (X) NB (X) NS (X) PEI (X) NFLD (X)
NWT ( ) YK ( ) **OTHER COUNTRIES** USSR, UK, Belgium, South Africa

EXAMPLES OF WORK ALREADY CARRIED OUT:

Installation of peat packaging system.

COMMERCIAL VENDORS FORM

COMPANY NAME Frank Maine Consulting Limited.

ADDRESS 71 Sherwood Drive,
Guelph, Ontario
N1E 6E6

PHONE (519) 823-1465

TELEX

ADDITIONAL OFFICES

CONTACT PERSON Dr. F.W. Maine.

SERVICES

SURVEYING	( )	ENGINEERING	( )
PROTOTYPE DESIGN	( )	LAB RESEARCH	(X)
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER .... ( )

COMPETENCE

AGRICULTURE	( )	ECOLOGY	( )	MARKETING	( )
BOTANY	( )	FORESTRY	( )	MINING	( )
CHEMISTRY	(X)	GEOLOGY	( )	TRANSPORT	( )
COMBUSTION	( )	HYDROLOGY	( )	VEHICLES	( )
DEWATERING	( )	INVENTORY	( )		

OTHER...( )

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?....4.....YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK..2....

PROVINCES OF CANADA EXPERIENCED WITH

								BC	( )	ALTA	( )
								SASK	( )	MAN	( )
ONT	(X)	QUE	( )	NB	( )	NS	( )	PEI	( )	NFLD	( )
NWT	( )	YK	( )								

OTHER COUNTRIES ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

Research and Development Reports.

COMMERCIAL VENDORS FORM

COMPANY NAME Montreal Engineering Company, Limited (MONENCO)

ADDRESS P.O. Box 1540,
One St. Paul,
St. Catharines, Ontario
L2R 7J9

PHONE (416) 688-9263

TELEX 061-5219
MONENCO STCA

ADDITIONAL OFFICES Head Office in Montreal and other offices across Canada.

CONTACT PERSON A. Ismail, Head of Thermal Studies.

* * *

SERVICES

SURVEYING	(X)	ENGINEERING	(X)
PROTOTYPE DESIGN	(X)	LAB RESEARCH	(X)
PRODUCTION	( )	COMPUTER ANALYSIS	(X)

OTHER ...Studies, R & D projects...................... (X)

COMPETENCE

AGRICULTURE	( )	ECOLOGY	(X)	MARKETING	(X)
BOTANY	( )	FORESTRY	( )	MINING	(X)
CHEMISTRY	(X)	GEOLOGY	( )	TRANSPORT	(X)
COMBUSTION	(X)	HYDROLOGY	(X)	VEHICLES	(X)
DEWATERING	(X)	INVENTORY	(X)		

OTHER......Peat Fuel, Power Generation....................(X)

* * *

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?.....9....YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK.......

PROVINCES OF CANADA EXPERIENCED WITH BC (X) ALTA (X)
SASK (X) MAN (X)
ONT (X) QUE (X) NB (X) NS (X) PEI (X) NFLD (X)
NWT ( ) YK ( ) **OTHER COUNTRIES** ..Jamaica, Senegal, USA

EXAMPLES OF WORK ALREADY CARRIED OUT:

Evaluation of Peat Dewatering and Peat Fuel Processes (NRC)
Feasibility Study for Peat-Fired Power Generation in New Brunswick (EM & R)
4 x 67 MV Peat-Fired Thermal Power Station STudy for Québec (Hydro-Québec)
Peat-Fired Greenhouse Heating System in Ontario (MNR Ont.)
2 x 30 MV Peat Power Project in Negril, Jamaica (World Bank & IADB)

* * *

COMMERCIAL VENDORS FORM

COMPANY NAME Monenco Limited.

ADDRESS 155 Rexdale Blvd.,
Rexdale, Ontario
M9W 5Z8

PHONE (416) 743-3456

TELEX 06-989419

ADDITIONAL OFFICES St. Catharines, Ont.; Montreal; Halifax; Fredericton; Regina; Calgary; Vancouver.

CONTACT PERSON G.W. Mankinen, Manager - Peat Group.

SERVICES

SURVEYING (X)
PROTOTYPE DESIGN (X)
PRODUCTION (X)
ENGINEERING (X)
LAB RESEARCH (X)
COMPUTER ANALYSIS (X)
OTHER .... (X)

COMPETENCE

AGRICULTURE (X)
BOTANY (X)
CHEMISTRY (X)
COMBUSTION (X)
DEWATERING (X)
ECOLOGY (X)
FORESTRY (X)
GEOLOGY (X)
HYDROLOGY (X)
INVENTORY (X)
MARKETING (X)
MINING (X)
TRANSPORT (X)
VEHICLES (X)
OTHER...(X)

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?....9.....**YEARS**

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK...6...

PROVINCES OF CANADA EXPERIENCED WITH

BC (X) ALTA (X)
SASK (X) MAN (X)
ONT (X) QUE (X) NB (X) NS (X) PEI (X) NFLD (X)
NWT ( ) YK ( )

OTHER COUNTRIES ..USA, Caribbean, Africa.

EXAMPLES OF WORK ALREADY CARRIED OUT:

Ontario Peatland Surveys;
Peatland surveys in Africa and USA;
Peat production demonstration projects in Eastern and Western Canada;
Engineering feasibility reports for Québec pulp and paper company;
The use of peat to produce methanol (Ont. Energy Corp.) for: U.S. utility co., Québec mining co., various government agencies etc.

COMMERCIAL VENDORS FORM

COMPANY NAME Morton & Partners Limited.

ADDRESS 215 Carlingview Drive,
Unit 311.
Rexdale, Ontario
M9W 5X8

PHONE (416) 675-1440

TELEX 06-989660
METROSPEED TOR

ADDITIONAL OFFICES London, North Bay, Thunder Bay

CONTACT PERSON J.D. Morton.

* * *

SERVICES

SURVEYING	(X)	ENGINEERING	(X)
PROTOTYPE DESIGN	(X)	LAB RESEARCH	( )
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER Cost Analysis & Preparation of Budget Estimates; (X)
Market Research; Financial Research & Planning.

COMPETENCE

AGRICULTURE	( )	ECOLOGY	( )	MARKETING	(X)
BOTANY	( )	FORESTRY	( )	MINING	(X)
CHEMISTRY	( )	GEOLOGY	(X)	TRANSPORT	( )
COMBUSTION	( )	HYDROLOGY	(X)	VEHICLES	( )
DEWATERING	(X)	INVENTORY	(X)		

OTHER...( )

* * *

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?...26.....**YEARS**

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK..4....

PROVINCES OF CANADA EXPERIENCED WITH BC ( ) ALTA ( )
SASK ( ) MAN ( )
ONT (X) QUE (X) NB ( ) NS (X) PEI ( ) NFLD ( )
NWT ( ) YK ( ) **OTHER COUNTRIES** ...United Kingdom........

EXAMPLES OF WORK ALREADY CARRIED OUT:

Development Potential of 1000 acre peat bog, Ottawa Valley (Private Corporate Client)

Development Potential and Investment Securities, Technical Support Document preparation, Northwestern Ontario (Private Corporate Client)

Eskasoni Indian Reserve #3 Peat Resource Development (Canadian Government)

Peat and Wetland Development v. Protection; evaluation as Part of Official Plan. (City of Thunder Bay)

Peat and Marshland Natural Habitat Enhancement for Section of Holland Marsh. (Ducks Unlimited)

COMMERCIAL VENDORS FORM

COMPANY NAME L.J. Rak Engineering Limited.

ADDRESS 117 Disco Road,
Rexdale, Ontario
M9W 1M3

PHONE (416) 675-0160

TELEX

ADDITIONAL OFFICES

CONTACT PERSON Mr. G. Niculae, p. eng.

SERVICES

SURVEYING	( )	ENGINEERING	(X)
PROTOTYPE DESIGN	( )	LAB RESEARCH	(X)
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER .... ( )

COMPETENCE

AGRICULTURE	( )	ECOLOGY	( )	MARKETING	( )
BOTANY	( )	FORESTRY	( )	MINING	( )
CHEMISTRY	( )	GEOLOGY	(X)	TRANSPORT	( )
COMBUSTION	( )	HYDROLOGY	(X)	VEHICLES	( )
DEWATERING	(X)	INVENTORY	(X)		

OTHER...( )

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?....4.....YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK..2....

PROVINCES OF CANADA EXPERIENCED WITH

								BC	( )	ALTA	( )
								SASK	( )	MAN	( )
ONT	(X)	QUE	( )	NB	( )	NS	(X)	PEI	( )	NFLD	( )
NWT	( )	YK	( )								

OTHER COUNTRIES ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

COMMERCIAL VENDORS FORM

COMPANY NAME Three-D GeoConsultants Limited.

ADDRESS 108 Prospect Street,
P.O. Box 3133, Station B,
Frederiction, N. B.
E3A 5G9

PHONE (506) 453-7700

TELEX

ADDITIONAL OFFICES

CONTACT PERSON David Keys.

SERVICES

SURVEYING (X)
PROTOTYPE DESIGN ( )
PRODUCTION ( )
ENGINEERING ( )
LAB RESEARCH ( )
COMPUTER ANALYSIS (X)
OTHER .... ( )

COMPETENCE

AGRICULTURE ( )
BOTANY (X)
CHEMISTRY (X)
COMBUSTION ( )
DEWATERING ( )
ECOLOGY (X)
FORESTRY ( )
GEOLOGY (X)
HYDROLOGY (X)
INVENTORY (X)
MARKETING (X)
MINING (X)
TRANSPORT (X)
VEHICLES (X)
OTHER...( )

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?.....7....**YEARS**

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK..2-3..

PROVINCES OF CANADA EXPERIENCED WITH BC ( ) ALTA ( )
SASK ( ) MAN ( )
ONT (X) QUE ( ) NB (X) NS ( ) PEI (X) NFLD ( )
NWT ( ) YK ( ) **OTHER COUNTRIES** ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

Field Investigations of Peatlands in Ontario
Computer Analysis of Inventory Data
Assessment of Utilization Potential of Selected Peatlands
Biogeochemical Prospecting

COMMERCIAL VENDORS FORM

COMPANY NAME Dendron Resource Surveys Ltd.

ADDRESS 880 Lady Ellen Place,
Suite 206,
Ottawa, Ontario
K1Z 5L9

PHONE (613) 725-2971

TELEX 05-33946

ADDITIONAL OFFICES

CONTACT PERSON Dr. Neilson

SERVICES

SURVEYING (X)
PROTOTYPE DESIGN ( )
PRODUCTION ( )
ENGINEERING ( )
LAB RESEARCH (X)
COMPUTER ANALYSIS (X)
OTHER ...Mapping and Inventory........................ (X)

COMPETENCE

AGRICULTURE ( )
BOTANY ( )
CHEMISTRY ( )
COMBUSTION ( )
DEWATERING ( )
ECOLOGY (X)
FORESTRY (X)
GEOLOGY (X)
HYDROLOGY (X)
INVENTORY (X)
MARKETING ( )
MINING ( )
TRANSPORT ( )
VEHICLES ( )
OTHER..( )

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?....3.....YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK...6...

PROVINCES OF CANADA EXPERIENCED WITH

BC ( ) ALTA ( )
SASK ( ) MAN ( )
ONT (X) QUE ( ) NB ( ) NS ( ) PEI ( ) NFLD ( )
NWT ( ) YK ( ) **OTHER COUNTRIES** ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

A review of Canadian peatland inventory data;
A survey of peatlands near Hearst, Ontario
(inventory and mapping);
A survey of peatlands near Foleyet, Ontario
(inventory and mapping);
Subcontractor for survey of peatlands near Rainy River,Ont.
Survey of Alfred Bog near Alfred, Ontario.

NON-COMMERCIAL VENDORS

COMPANY NAME Fire Science Centre.

ADDRESS University of New Brunswick,
P.O. Box 4400,
Fredericton, N. B.

PHONE (506) 453-4509

TELEX 014-46-202

ADDITIONAL OFFICES

CONTACT PERSON Dr. Ross Wern.

SERVICES

SURVEYING	( )	ENGINEERING	(X)
PROTOTYPE DESIGN	( )	LAB RESEARCH	(X)
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER .... ( )

COMPETENCE

AGRICULTURE	(X)	ECOLOGY	(X)	MARKETING	( )
BOTANY	(X)	FORESTRY	(X)	MINING	( )
CHEMISTRY	( )	GEOLOGY	( )	TRANSPORT	( )
COMBUSTION	(X)	HYDROLOGY	( )	VEHICLES	( )
DEWATERING	( )	INVENTORY	( )		

OTHER...( )

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?....10....YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK.......

PROVINCES OF CANADA EXPERIENCED WITH BC ( ) ALTA (X)
SASK ( ) MAN ( )
ONT ( ) QUE ( ) NB (X) NS ( ) PEI ( ) NFLD ( )
NWT (X) YK ( ) **OTHER COUNTRIES** ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

COMMERCIAL VENDORS FORM

COMPANY NAME Pydee Engineering Company Limited.

ADDRESS 1018 Sherbrooke Street,
Winnipeg, Manitoba
R3A 1N8

PHONE (204) 774-7418

TELEX 07-55628

ADDITIONAL OFFICES

CONTACT PERSON Mr. Norman C. Pydee.

SERVICES

SURVEYING	( )	ENGINEERING	( )
PROTOTYPE DESIGN	( )	LAB RESEARCH	( )
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER .... ( )

COMPETENCE

AGRICULTURE	( )	ECOLOGY	( )	MARKETING	( )
BOTANY	( )	FORESTRY	( )	MINING	( )
CHEMISTRY	( )	GEOLOGY	( )	TRANSPORT	( )
COMBUSTION	( )	HYDROLOGY	( )	VEHICLES	( )
DEWATERING	( )	INVENTORY	( )		

OTHER Manufacturing of Milling, Mixing and Baling Equip. (X)

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?..........YEARS

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK..0....

PROVINCES OF CANADA EXPERIENCED WITH BC ( ) ALTA ( )
SASK ( ) MAN ( )
ONT ( ) QUE ( ) NB ( ) NS ( ) PEI ( ) NFLD ( )
NWT ( ) YK ( ) **OTHER COUNTRIES** ....

EXAMPLES OF WORK ALREADY CARRIED OUT:

COMMERCIAL VENDORS FORM

COMPANY NAME Elizabeth Snell and Charles Cecile.

ADDRESS R.R. 1,
Cambridge, Ontario
N1R 5S2

PHONE (519) 623-0755

TELEX

ADDITIONAL OFFICES

CONTACT PERSON Elizabeth Snell.

SERVICES

SURVEYING	(X)	ENGINEERING	( )
PROTOTYPE DESIGN	( )	LAB RESEARCH	( )
PRODUCTION	( )	COMPUTER ANALYSIS	( )

OTHER ...Environmental Research....................... (X)

COMPETENCE

AGRICULTURE	(X)	ECOLOGY	(X)	MARKETING	( )
BOTANY	(X)	FORESTRY	( )	MINING	( )
CHEMISTRY	( )	GEOLOGY	( )	TRANSPORT	( )
COMBUSTION	( )	HYDROLOGY	(X)	VEHICLES	( )
DEWATERING	( )	INVENTORY	(X)		

OTHER......Soils..(X)

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?.....10...**YEARS**

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK.......

PROVINCES OF CANADA EXPERIENCED WITH BC ( ) ALTA ( )
SASK ( ) MAN ( )
ONT (X) QUE ( ) NB ( ) NS ( ) PEI ( ) NFLD ( )
NWT ( ) YK ( ) **OTHER COUNTRIES** ....

B EXAMPLES OF PEAT-RELATED OUTPUT:

Mapped Soils and Agricultural Capability of Holland Marsh;
M.Sc. Thesis "Landform Classification and Vegetation-Soil Relationships of Southern Ontario Wetlands";
Numerous surveys and environmental appraisals of wetlands throughout Southern Ontario for private companies, government and private non-profit groups;
As environmental Canada employee - participated in federal-provincial steering committee to develop wetland evaluation system for Southern Ontario;
Oshawa Second Marsh Baseline Study;
Document, Integrate and Interpret Ecological Data.

COMMERCIAL VENDORS FORM

COMPANY NAME (Garry T.) HUNTER and ASSOCIATES.

ADDRESS Suite 201, 6870 Goreway Drive,
Mississauga, Ontario.
L4V 1P1

PHONE (416) 678-6844

TELEX 06-983527

ADDITIONAL OFFICES

CONTACT PERSON Mr. Garry T. Hunter, P. Eng.

SERVICES

SURVEYING	(X)	ENGINEERING	(X)
PROTOTYPE DESIGN	( )	LAB RESEARCH	( )
PRODUCTION	( )	COMPUTER ANALYSIS	( )
OTHER			( )

COMPETENCE

AGRICULTURE	(X)	ECOLOGY	(X)	MARKETING	( )
BOTANY	(X)	FORESTRY	(X)	MINING	( )
CHEMISTRY	( )	GEOLOGY	(X)	TRANSPORT	( )
COMBUSTION	( )	HYDROLOGY	(X)	VEHICLES	( )
DEWATERING	( )	INVENTORY	(X)		
OTHER..					( )

PERIOD OF INVOLVEMENT IN PEAT-RELATED WORK?....10....**YEARS**

NUMBER OF FULLTIME EMPLOYEES INVOLVED IN PEAT-RELATED WORK...4...

PROVINCES OF CANADA EXPERIENCED WITH								BC	( )	ALTA	( )
								SASK	( )	MAN	(X)
ONT	(X)	QUE	(X)	NB	(X)	NS	(X)	PEI	(X)	NFLD	(X)
NWT	( )	YK	( )	**OTHER COUNTRIES** ..Barbados..............							

EXAMPLES OF WORK ALREADY CARRIED OUT:

New Liskeard Peatland Inventory, Ontario.
Armstrong Area Peatland Field Surveys, Ontario.
Labrador Ecological Land Survey, Newfoundland.
New Brunswick Wetlands Inventory.

THESES ON PEAT IN CANADA

The following theses are listed in alphabetical order by author, in two sections. These were prepared by Doctoral and Master's students. The first section contains those theses carried out in Canadian Universities while the second section contains some pertinent U.S. theses. The listings were obtained from a CISTI computer search over a wide range of data bases using such key words as BOG, CAREX, FEN, MARGINAL TERRAIN, MARSH, MUSKEG, ORGANIC SOIL, PEAT SEDGE, SPHAGNUM, TOURBE, TOURBIERE, WETLAND, as well as a variety of pertinent geographical terms. Some of the theses are available through the National Library of Canada in Ottawa. Numbers are given for these. Other (particularly U.S.) theses are available through University Microfilms International (U.M.I.) and the order numbers are given. Dissertation Abstract International (D.A.I.) references (Ref.) are also given where available.

THESES ON PEAT IN CANADA

Canadian Theses.

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Bateman, Lois E. An Ecological Study of Hummock-Hollow Formations on Certain Peatlands of the Avalon Peninsula, Newfoundland, With Special Emphasis on the Rotifera. M.Sc. Memorial University. 1975. #25539.

Bayly, Isabel Law. The Ecology of Genus Typha in Wetland Communities of the Eastern Ontario-Western Quebec Region of Canada. Ph.D. U.B.C. 1974. #19493.

Beauregard, Bernard. Etude de l'Activation du Charbon De la Tourbe Naturelle et Impregnee d'ions Specifiques par le Bioxyde de Carbone. M.Sc.A. Sherbrooke. 1976. #32204.

Biddick, Kathleen A. Animal Husbandry and Pastoral Land-Use on the Fen Edge, Peterborough, England: An Archaeological and Historical Reconstruction, (2500 B.C.-A.D. 1350). Ph.D. University of Toronto. 1982. 43/03-A. of Dissertation Abstracts International. History, Medieval. p 890.

Biggs Wayne Griffin. An Ecological and Land Use Study of Burns Bog, Delta, B.C. M.Sc. U.B.C. 1976. #29799.

Blasco, Judith Ann. Nitrogen Fixation in the Muskeg Ecosystem of the James Bay Lowlands, Northern Ontario. M.Sc. University of Guelph. 1975. #23584.

Bowman, Paul William. Study of a Peat Bog near the Matamek River, Quebec, Canada, by the Method of Pollen Analysis. Ph.D. University of Virginia. 1930. Ref. p.16 Vol. L1931.

Briaud, Jean-Louis. Development of Peat Mechanics at U.N.B., 1972-1974. M.Sc. University of New Brunswick. 1974. #22882, #11882.

Chatwin, S.C.; Permafrost Aggradation and Degradation in A Sub-Arctic Peatland. Master's. Univ. of Alberta. 1981.

Ceska, Adolf. Vegetation Classification: 1. A Computer Method for Handling Vegetation Data; Wetland Plant Communities in the Wet Douglas Fir Subzone of Vancouver Island. Ph.D. University of Victoria. 1978. #37194.

Cogbill, Charles van Horn. Analysis of Vegetation, Environment, and Dynamics in The Boreal Forests of the Laurentian Highlands, Quebec. Ph.D. University of Toronto. 1982. 44/03-B. p 691.

Corbett, John Richard Ernest. Treatment of a Low Strength Landfill Leachate With Peat. M.A.Sc. University of British Columbia. 1975. #25120.

Dai, Tze-Sen. Studies on the Ecological Importance of Water Flow in Wetlands. Ph.D. Univesity of Toronto. 1971. #27816.

Duman, Maximillian G. The Genus Carex in Eastern Arctic Canada. Ph.D. The Catholic University of America. 1941. Ref. p.57. Vol. W1941.

Elrick, Wendy Kathryn. Relationships Between Tree Associations and Selected Organic Soil Characteristics. Ph.D. University of Guelph. 1982. 2 Microfiches (111 Fr.)

Fauteux, Denis. Reactivite Avec le CO2, H20 et H2 a Haute Pression de la Tourbe Carbonisee. Ph.D. Universite de Sherbrooke. 1981. (Microfiche).

Gelinas, Denise. Le Problème de l'Amènagement des Tourbieres. M.Sc. Université Laval. 1982. In Press.

Grandbois, Marc. The Conversion of Peat: Complex Chemical Equilibria of the Pyrolysis of Peat; High Pressure Hydrogenation of Humic Acids. M.Sc.A. Sherbrooke University. 1977. #37903.

Harbec, Fernand. Etude Thermogravimetrique de l'Amminiaquation de la Tourbe et Introduction au Traitment des Polluants Gazeux par la Tourbe Ammoniaquee. M.Sc.A. Sherbrooke University. 1978. #37903.

Hayoz, Bernard. Etude des Performances de la Tourbe dans des Operations d'Echangeionique. M.Sc.A. Sherbrooke University. 1976.

Heyes, Glenn E. The Effect of Clipping Date and Height on Forage Yields, Nutritive Quality and Stored Food Reserves of a Chilcotin Wetland Meadow. M.Sc. U.B.C. 1979. #46150.

Hollingshead, Garry W. Load Deformation Characteristics of Muskeg. Ph.D. Queen's University. 1973. #14071.

Hons, Douglas B. Thermophysical Characterization of the Surface Tier of an Organic Soil At Sub-Zero Termperatures. M.Sc. University of Guelph. 1975. #22701.

Hurley, J. Edward. Bog Fungi and Studies of Their Activity. M.Sc. University of New Brunswick. 1981. #55471.

Johnson, Dominic A. Nutritive Evaluation of Reed Canarygrass, Phalaris Arundinacea L., Grown in Newfoundland on Peat or Mineral Soil. M.Sc. McGill University. 1976. #29374.

Ketcheson, Maureen V. Vegetation and Vegetation Environment Relationships in a Muskeg-Fen near Thunder Bay, Ontario. M.Sc. University of lakehead. 1980. #47488.

Korpijaakko, Erkki O. Aerial Interpretation of Muskeg: A Critical Analysis of Form Features in the Canadian Muskeg Complex. Ph.D. McMaster University. 1970. Ref. p.28 Vol. S1970.

Korpijaakko, Jaakko M. Studies on the Hydraulic Conductivity of Peat. Ph.D. U.N.B. 1975. #27394.

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Landreville, Alain. Traitement des Eaux Usees k'Abattoris avec une Tourbe de Sphaigne. M.Ch.A. Sherbrooke University. 1978. #41266.

Landva, Arvid Otto. Geotechnical Behaviour and Testing of Peat. Ph.D. Universite Laval. 1980. #56354.

Langlois, Pierre. Etude de La Compressibilite Et De La Permeabilite de Deux tourbes Fibreuses. M.SC.A. Universite De Sherbrooke. 1982. #56078.

Lehto, D.A.W. The Application of a Sequential Partial Extraction Procedure to Investigate Uranium, Copper, Zinc, Iron and Manganese Partitioning in Recent Lake Stream and Bog Sediments. Northern Saskatchewan. M.Sc. Lakehead University. 1981. #56401.

Lett, Raymond E.W. Secondary Dispersion of Transition Metals through a Copper-Rich Bog in the Cascade Mountains, British Columbia. Ph.D. U.B.C. 1979. #42862.

Lidkea, Thomas R. Treatment of Sanitary Landfill Leachate with Peat. M.A.Sc. U.B.C. 1974. #22154.

Lieffers, Victor J. Environment and Ecology of Scirpus Maritimus L. Var. Paludosus (Nesl.) Kuk in Saline Wetlands of the Canadian Prairies. Ph.D. University of Manitoba. 1981. #18296.

Lierop, William J.C. M. Van. Chemical, Physical, Physiological and Agronomic Aspects of Soil Acidity and Liming of 10 Organic Soils From South-West Quebec. M.Sc. McGill University. 1973. #18296.

-----. Fertilization of Acid Organic Soils from Quebec. Ph.D. Laval University. 1979. #41923.

Logan, Robert J. Peat as a Soil Amendment for Tailing and Reclamation. M.Sc. University of Alberta. 1978. #36421.

Madors, M. Rose B. An Ecological Study of The Genus Carex in Eastern Subarctic Canada. Ph.D. The Catholic University of America. 1951. Ref. p.107 Vol. W1951.

Mapplebeck, Lloyd R. Degradation and Detection of Linuron in Organic Soils. M.Sc. University of Guelph. 1980. #48779.

Meeking, Douglas N. An Investigation of the Permafrozen Peat in Palsas of the Hudson Bay Lowlands of Canada. M.Sc. U.N.B. 1974. #22937.

Michellon, Bernard. Essais de Synthese d'Echangeurs d'Anions a Partir de Tourbe de Sphaigne. M.Sc.A. Sherbrooke University. 1978. #37913.

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Muc, Michael. Ecology and Primary Production of High Arctic Sedge-Moss Meadows, Devon Island, N.W.T. Canada. Ph.D. University of Alberta. 1976. #27713.

Nelson, Richard W.P. Cation Exchange on a Nova Scotia Peat Soil. M.Sc. Dalhousie University. 1980. #48256.

Neptune-Rouzier, Marilise. Accumulation de Tourbe et Succession des Espèces de Sphaignes dans une Tourbière. M.Sc. Laval University. 1981. In Press.

Nosko, Peter. Water and Energy Relations of Carex Stans in a High Arctic Microenvironment, Devon Island, N.W.T. M.Sc. Laurentian University. 1978. #51415.

Ogwang, Bob H. Some Plant-mediated processes in the Maritime Wetlands of South Western British Columbia. Ph.D. U.B.C. 1979. #46224.

Patterson, James H. The Role of Wetland Heterogeneity in the Regulation of Duck Populations in Eastern Ontario. Ph.D. Carleton University. 1972. Ref. p.5425 Vol. 34/11-B.

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Salahub, J.D. The Effect of Crude Oil on Anaerobic Nitrogen Fixation in a Muskeg Ecosystem. M.Sc. University of Alberta. 1977. #34469.

Samson, Helen. Evolution du Pergelisol en Milieu Tourbeux en Relation avec le Dynamisme de la Vegetation, Golfe de Richmond, Nouveau-Quebec. M.Sc. Laval University. 1975. #26564.

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Sims, Richard Allan. Reindeer Winter Rangeland, Tuktoyaktuk Peninsula Area, N.W.T. Ph.D. U.B.C. 1983. 44/05-B. p.1296.

Smee, Barry Warren. Laboratory and Field Evidence in Support of Electrogeochemically Enhanced Ionic Diffusion Through Glaciolacustrine Sediment. Ph.D. U.N.B. 44/04-B. p.1032.

Slot, John C. A Quantification of the Organic Soil Capability Classification System for Agriculture. M.Sc. University of Guelph. 1974. #20149.

Smeins, Fred Eldon. The Wetland Vegetation of the Red River Valley and Drift Prairie Regions of Minnesota, North Dakota and Manitoba. Ph.D. University of Saskatchewan. 1967. Ref. p.3963. Vol. 28/10-B.

Smith, Helda E. Observations on the Vegetation of an Avalon Bog Pond. M.Sc. Memorial University of Newfoundland. 1971. #16678.

Snell, Elizabeth A. Landform Classification and Vegetation-Soil Relationships Of Southern Ontario Wetlands. M.Sc. University of Guelph. 1976. #28140.

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Stewart, Robert E. Forests, Wetlands and Waterfowl Populations in the Turtle Mountains of North Dakota and Manitoba. Ph.D. North Dakota State University. 1972.

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V

FEDERALLY-FUNDED PEAT RESEARCH AT CANADIAN UNIVERSITIES

FEDERALLY-FUNDED PEAT-RELATED RESEARCH AT CANADIAN UNIVERSITIES.

UNIVERSITY	GRANT RECIPIENT	# OF GRANTS	YEARS
U.B.C	Atwater,	1	82-83
	Barnes, W.C.	1	82-83
	Brink, V.C.	2	76-78
	Grace, J.R.	3	83-86
	Lim, C.J.	3	82-86
	Paszner, L.	3	83-86
U. Alberta	Anthropology Dept.	1	76-78
	Clifford, H.F.	8	71-76/77-79
	Gray, J.	3	80-85
	Knowles, R.H.	1	75-76
	Lieffers, V.J.	3	83-86
	Rothwell, R.L.	8	71-76/77-79
U. Calgary	Walker, G.	3	76-79
U. Regina	Viraraghavan, T.	3	83-86
U. Manitoba	Bayley, S.	1	82-83
	Fehr, P.	1	72-73
	Pritchard, M.K.	1	82-83
	Racz, G.J.	3	78-81
	Stewart, J.M.	6	71-77
Brock U.	Terasmae, J.	10	75-83
Carleton U.	Bayly, I.	1	78-79
U. of Guelph	Buchanan-Smith, J.G. (1 Associate)	1	81/82
	Hoffman, D.W.	2	73-75
	Protz, R.	5	77-82
	Reader, R.J.	5	75-76/79-84
Laurentian U.	Courtin, G.M.	3	74-77
	Ferroni, G.D.	3	84-87
McMaster U.	Bunting, B.T.	3	81-84
	Wilson, N.E.	2	74-75/78-79
Ottawa U.	Hornoff, V.	3	84-87
Queen's U.	Brown, S.R.	4	81-85
	Crowder, A.A.	5	78-86
	Raymond, G.P.	8	71-75
	Vreeken, W.J.	2	77-79
U. of Toronto	Adams, B.J.	3	83-86
	Ball, P.W.	12	71-83
	Davis, A.M.	3	80-83

	Gwynar, L.C.	3	83-86
	Measures, R.M.	1	77-78
	Ritchie, J.C.	4	80-84
	Sparling, J.H.	2	71-73
U. of Waterloo	Moo-Young, M.	3	81-82
	Robinson, R.W. (1 Associate)	1	81-82
U. Laval	Grantner, M.M.	2	71-73
	LeDuy, A.	5	80-85
McGill U.	Broughton, R.S.	3	78-81
	Guthrie, R.I.L.	3	74-77
	Moore, T.R.	2	82-84
	Yong, R.N.	4	76-80
Qué.-Trois-R.	Daneault, C.	3	84-87
	Law, K.N.	4	81-85
U. de Montreal	Richard, P.J.H.	5	78-82
U. de Sherbrooke	Chornet, E.T.	4	82-85
	Coupal, B.	7	71-78
	Lareau, J.L.	1	80-81
U. of N.B.	Douglas, R.A.	3	84-87
	Faige, W.	3	84-87
	MacFarlane, H.W.	3	73-76
	Radforth, N.W.	12	71-77
	Rawlence, D.J.	3	84-87
	Valsangkar, A.J.	2	82-84
Dalhousie U.	Medioli, F.S.	1	81-82
	Scott, D.		
Technical U.	Basu, P.	3	83-86
Memorial U.	Anderson, M.M.	5	82-88
	Martin, A.M.	2	81-83
	Robb, A.	2	78-80
	South, G.R.	3	79-82
	Waterhouse, J.	3	78-81

FEDERAL GOVERNMENT-FUNDED PEAT-RELATED RESEARCH: LISTED BY RESEARCHERS

Researcher	University & Dept.	Title	$/Year	Duration
Adams, B.J.	U. Toronto	Analytical Modelling of Drainage System Performance	13,913	83-86
Anderson, M.M.	Memorial U. Biology	Contributions to Palaeontology and Stratigraphy, Mainly Newfoundland.	$9,500	82-88
	U. Alberta Anthropology Dept.	Identification and Description of Plant Communities in Peat Bogs, Elk Island, N.P.	6,000	75-76
Atwater, J.W.	U.B.C. Civil Eng.	Analysis and interpretation of 8 peat bog samples	19,390 ENV	82-83
Ball, P.W.	U. Toronto Botany	Taxonomy & Distribution of Carex in Eastern Canada.	3,500	71-72
			4,500	72-73
			4,500	73-74
			4,500	74-75
			4,875	75-76
			5,000	76-77
			5,420 N.R.C.	77-78
-----	------	Studies in the Flora of Eastern Canada.	5,000	78-79
			5,000	79-80
			5,490	80-81
			6,039	81-82
			7,800	82-83
Baly, I.	Carleton U. Biology	Analysis of the Impact on Wetlands by the Proposed Lake Erie Regulation-(on behalf of ENV-International Lake Erie Regulation Study).	21,756 DSS	78-79
Barnes, W.C.	U.B.C. Geo. Sci.	Sedimentology and organic geochemistry of lake sediments and peats of southwestern British Columbia	6,000 NSERC	82-83

Basu, P.	Tech. U. CREN N.S.	A Study of Burning Rate of Particles in Circulating Fluidized Beds.	16,240 NSERC	84-87
Bayley, S.	U. Manitoba Natural Resource Institute	Effects of Acid Precipitation on the Mobilization of Trace Metals from Bogs to Freshwater Fish Habitat	110,053 DSS	82-83
Brink, U.C.	U.B.C. Plant Science	Nutritional Evaluation of Wetland Rushes and Grasses.	5,000 3,000 CDA	76-77 77-78
Brown, S.R.	Queen's Biology	Paleolimnology & the Paleoecology of Lakes.	19,635	81-85
Broughton, R.S.	McGill U. Agri. Engineering	Determination & Evaluation of the Movement & Fate of Applied Fertilizers & Pesticides in Organic Soils Under Natural Field.	6,000 6,500 7,000 CDA	78-79 79-80 80-81
Buchanan-Smith, J.G.	Guelph U.	Evaluation & Implications of Protein in Ruminant Nutrition.	NSERC	81-82
-----; Moo-Young, M.		Conversion of Cellulosic Materials into Animal Feed by Semi-Solid Fermentation.		
Bunting, B.T.	McMaster U. Geography	Morphology & Dynamics of Organic Matter In Burned-Over Forest Soils Central Ontario.	8,904 NSERC	81-84
Chornet, E.T.	Sherbrooke U. Gènie Chemique	Aspects Cinètiques et Catalytiques Couplès Transfert de Unasse (Systèmes à Frois Phases) Dans les Réactions de "Liquification".	NSERC 28,700	82-85
-----	---	Solvolysis and Selective Fractionation of Peat	248,182 DSS/NRC	82-83
Clifford, H.F.	U. Alberta Zoology	1)Ecology of Crustacea in Alta. 2)Limnology of Muskeg Streams.	6,000 6,000 7,000 NRC	71-72 72-73 74-75

		1)Limnology of Muskeg Streams.	7,985	75-76
		2)Ecology of Crustacea & Other Invertebrates in Alberta.	8,000 8,672 9,192	76-77 77-78 78-79
Coupal, B.	U. Sherbrooke Mech. Eng.	Utilisation de la Tourbe	57,000 79,000 175,000 150,000 100,000 57,500 31,000 NRC	71-72 72-73 73-74 74-75 75-76 76-77 77-78
Courtin, G.M.	Laurentian U. Biology	Adaptation of the Sedge Carex Stans, to Growth in the Cold, Shallow Active Layer of Peat Soils on Devon Island, N.W.T.	3,000 2,440 3,000 NRC	74-75 75-76 76-77
Crowder, A.A.	Queens U. Biology	1)Paleoecology & Vegetation of Westport Bog, Leeds Co., Ont.	6,000 NSERC	78-79
		2)The Pioneer Phase of Old Field Succession in Eastern Ontario.		
-----	------	Study of the Interactions between Copper Nickel, and Iron in Contaminated Wetland Soils	26,290 DSS/NRC	82-83
-----.	-----.	Heavy Metal Uptake by Root Systems of Wetland Plants, With And Without Iron Plaques.	11,687	83-86
Daneault, C.	Qué.-Trois-R. P. et Papiers	Modification Chimique de la Cellulose	14,469 NSERC	84-87
Davis, A.M.	U. Toronto Geography	Palynology & Paleoecology of Peatlands Ecoregions in NFLD.	8,500 NSERC	78-79
-----.	-----.	Palynology & Paleoecology of Peatlands in NFLD.	9,000 9,000	81-82 82-83
Douglas, R.A.	U.N.B. For. Eng.	Study of Geotextile Reinforced Aggregate Roads on Soft Subgrades	12,000 NSERC	84-87
Faige, W.	U.N.B. Surv.Eng.	Utilization of the Analytical Plotter in Automa-	24,000 NSERC	84-87

		ting Photogrammetric Subsidence Measurements		
Fehr, P.	U.Manitoba Soil Science	Analyses of Wetland Soil Samples.	300 ENV-WS	72-73
Ferroni, G.D.	Laurentian U. Biology	1) The Impact of Acidification on Aquatic Microbial Activities 2) Bacterial Exopolymer Production & Characterization of the Exopoly Saccharide.	8,000 NSERC	84-87
Grace, J.R.	U.B.C. Chem. Eng.	Studies on Fluidized Beds and Related Particulate Systems	48,566 NSERC	83-86
Grandtner, M.M.	Laval U. Pedology/ Ecology	Ecologie des Tourbieres au Quebec Meridional	5,500 5,500 NRC	71-72 72-73
Gray, J.	U. Alta. Physics	An Investigation of Long Term Climatic & Environmental Changes by Stable Isotope Analysis of Tree Ring & Peat Moss Material.	13,500 NSERC	80-81
-----.	-----.	as above but also stalagmite material.	10,500	81-82
-----	-----	Stable Isotope Studies of Tree Rings, Peat & Cave Deposits to Determine Past Climate in Canada	4,000 NSERC	84-85
Guthrie, R.I.L.	McGill U. Mining Eng.	Gasification of Peat in Spouted Bed Reactor.	12,300 10,000 5,200 EMR	74-75 75-76 76-77
Gwynar, L.C.	Toronto U. Botany	Paleoecology & Dynamics of Treeline & Climate of Berngia.	13,587 NSERC	83-86
Hoffman, D.W.	U. Guelph Land Res. Sci.	Organic Soils: Their Characteristics, Classification, & Agricultural Productivity.	4,500 5,000 NRC	73-74 74-75
Hornoff, V.	U. Ottawa Chem. Eng.	Lignin-Containing Surfactant Formulations for Enhanced Oil Reco-	29,064 NSERC	84-87

		very		
Knowles, R.H.	U. Alta. Plant Sci.	Evaluation of Peat from Various Sources in Western Canada, As Media for Growing Containerized Conifer Seedlings (on behalf of ENV).	6,520 DSS	75-76
Lareau, J.L.	U. Sherbrooke	Catalytic Pyrolysis & Gasification of Lignocellulosic Materials.	57,300	80-81
Law, K.N.	Qué-Trois-R. P. et Papiers	Valorisation d'Essences Ligneuses à Faible Valeur Commerciale	15,805 NSERC	81-85
LeDuy, A.	U. Laval Chem. Eng.	Fermentations des Hydrolysats de Tourbe	35,000 43,715 NSERC	80-81 82-83
-----	---	Recherche en Bioénergie Microbienne	17.808 NSERC	81-85
Lieffers, V.J.	U. Alberta Forest Science	Production of Peatland Trees & Shrubs in Relation to Environmental Variables in North-Central Alberta.	11,130	83-86
Lim, C.J.	U.B.C. Chem. Eng.	Spouted Beds Hydrodynamics and Heat Transfer	14,469 NSERC	82-86
Martin	Memorial U.	Utilization of Peat as Fermentation Substrata	10,000 11,550 NSERC	81-82 82-83
McFarlane, H.W.	U.N.B. Civ. Eng.	Geotechnical Investigation of Muskeg as Related to Forest Roads.	6,500 6,500 7,415 NRC	73-74 74-75 75-76
Measures, R.M.	U. Toronto Aero. Stds.	Study of Peat Flouoresecence Characteristics (on Behalf of AGR).	6,955 DSS	77-78
Medioli, F.S.; Scott, D.	Dalhousie U. Geology	Foramniferal Distribution in Coastal & Inland Marine Water & Its Importance in the Study of Eustatic Sealevel Changes.	13,750 NSERC	80-81
Moo-Young, M.	U. Waterloo Chem. Eng	1)Biochemical Engineering Design of Fermen-	36,518 NSERC	81-82

		tation Processes. 2)Transport Phenomena in Multiphase Contacting Devices.	
-----.	-----.	-To Spend leave at: 1)College, London, U.K. 2)Swiss Federal Institute of Technology; Lausanne, Switzerland; 3)University of Hannover, Germany (Oct. 81-June 82)	1,500 81-82 NSERC
-----.	-----.	-Conversion of Cellulosic Materials into Animal Feed by Semi-Solid Fermentation (with collaboration of C.W. Robinson & J.G. Buchanan-Smith).	22,000 81-82 NSERC
Moore, T.R.	McGill U. Geography	The Biogeochemistry of Northern Peatlands	23,000 82-83 20,695 83-84 NSERC
Paszner, L.	U.B.C. Forestry	Analysis and Evaluation of the Mechanism of Derivative Formation in Acid Catalysed Hydrolysis of Cellulosics and Starches in Aqueous Acetone Solutions	16,250 83-86 NSERC
Pritchard, M.K.	U. Manitoba Plant Sci.	Changes in the Herbicide Binding Properties of Organic Soils	8,400 82-83 CDA
Protz, R.	U. Guelph Land Res.	1)Genesis of Norhtern Ont. Gleysolic, Podzolic & Organic Soils. 2)Quantification of Individual Mineral Grains during Soil Genesis. 3)Quantification of Soil Structure. 4)Computer Modelling of Soil Development.	10,150 81-82 NRC
-----.	-----.	-as above but sans item 4.	10,150 77-78 NRC
-----.	-----.	-as in 78-79 but with addition of "cryosolic" after podzolic"	9,500 79-80 9,500 80-81 NSERC
-----.	-----.	-part one only (with	7,000 81-82

		crysolic)	NSERC
Racz, G.J.	U. Manitoba Soil Science	Major & Minor Element Requirements of Crops Grown on Organic Soils.	6,000 78-79 6,000 79-80 7,000 80-81 CDA
Radforth,	U.N.B. Biology	Environmental Influence on Muskeg Types Significant in Muskeg Utilization.	15,000 71-72 15,000 72-73 NRC
-----.	-----.	"Muskeg in Water Resources".	20,000 71-72 15,000 72-73 Env-Water Resource Research.
-----.	-----.	A National Inventory for Muskeg Types.	5,000 71-72 5,000 72-73 DRB
-----.	-----.	A Hydrological Classification.	14,559 73-74 Env-Water Resource Research.
-----.	-----.	Military Vehicle Rut History in Permafrost of Fort Churchill Muskeg.	6,500 73-74 DRB
-----.	-----.	Classification of Muskeg (Peat & Peatlands) as related to Geotechnical Properties & User Requirements as Based on Environmental Influences	12,650 73-74 12,650 74-75 14,430 75-76 NRC
Rawlence, D.J.	U.N.B. Science	Palaeoecology of Selected N.B. Lakes.	10,000 84-87 NSERC
Raymond, G.P.	Queen'S U. Civ. Eng.	Stability of Airfield & Foundation Pads in Muskeg.	4,000 71-72 4,000 72-73 5,500 73-74 5,000 74-75 DRB
		1)Consolidation & Related Rate of Gain in Strength of Clay 2)Stability of Foundations on Muskeg.	11,500 71-72 11,500 72-73 14,000 73-74 13,080 74-75 NRC

Reader, R.J.	U. Guelph Botany &	Patterns of Photosynthate Alboration by Peatbog Shrubs of the Ericaceae Family.	3,415 NRC	75-76
-----.	-----.	Seasonality Studies Involving Abandoned Pasture & Peat Bog Plant Populations.	15,000 16,470 18,117 13,500 NSERC	79-80 80-81 81-82 82-83
Richard, P.	U. Montreal Geography	Etudes des Macrorestes de la Tourbiere de Farnham.	12,000 7,500 7,000 CDA	78-79 79-80 80-81
-----.	-----.	De la Compaction Differentiel des Horizons de Profil d'Ormstown, P.Q. sous l'Effet de la Mise en Culture.	6,500 CDA	80-81 81-82
Ritchie, J.C.	U. Toronto Botany	Vegetation Dynamics & Paleoecology of Beringia.	65,000	80-84
Robb	Memorial U. Engineering	Development of an Independently Powered Flotation Rotoridger-Precision Seeder for Specific Use on NFLD Peat Soils (On behalf of CDA)	154,172 DSS	78-79
-----	---	Development of a Peat Bog Cult- & Root Crop Harvester Transporter (on behalf of CDA).	152,052 DSS	79-80
Robinson, C.W.	U. Waterloo Chem. Eng.	Mass Transfer, Mixing & Kinetic Rate Studies of Chemical & Biochemical Systems.	15,985 NSERC	81-82
with M. Moo-Young	---	Conversion of Cellulosis Materials into Animal Feed by semi-solid fermentation		
Rothwell, R.L.	U. Alberta Forest Eng.	Heat Pulse Technology as a Method for Transpiration Measurement in White Spruce on Wetland Sites	8,000 8,480 8,777 NRC 9,000	77-78 78-79 79-80 80-81
Siemens, A.	U.B.C. Geography	Prehispanic Wetland Agriculture	12,271 SSHR	82-83

South, G.R.	Memorial U. Biology	Floristic/Ecological & Life History Studies of Marine Algae: Ecology of Ombiotrophic/Minerotrophic Bog Pools in Nfld.	22,000 24,156 26,576 NSERC	79-80 80-81 81-82	
Sparling, J.H.	U. Toronto Botany	Studies on the Ecology of Wetlands	9,000 9,000 NRC	71-72 72-73	
Stewart, J.M.	U. Manitoba Botany	Primary Productivity of Peatland Vegetation	5,800 5,800 5,800 NRC	71-72 72-73 73-74	
-----	---	1) Accumulation Dynamics of Peatland Vegetation 2) Use of Remote Sensing in Assessing Peatland Productivity	8,000 9,125 9,360 NRC	74-75 75-76 76-77	
Terasmae, J.	Brock U. Geol. Sci.	Radiocarbon Dating of Peat Samples (for ENV)	1,200 480 DSS	75-76 75-76	*
-----	---	Radiocarbon Dating and Pollen Analysis of Peat Moss Samples (for ENV)	1,080 DSS	76-77	*
-----	---	Radiocarbon Dating of 13 Samples of Wood & Peat & Pollen Analysis of 170 Samples from 4 Sections of the Southern District of Keewatin (for ENV)	2,310 DSS	77-78	*
-----	---	Peat Stratigraphy & Rates of Deposition, Related to Climate Change & Postglacial Geological History	16,300 NSERC	78-79	
-----	---	Correlation of Radiocarbon Chronology & Palynostratigraphy of Postglacial Lake Sediments & Peat Deposits	16,000 10,000 11,000 12,705 NSERC	79-80 80-81 81-82 82-83	
-----	---	Determination of Radiocarbon Age of Peat Samples	3,000 DSS/ENV	82-83	
Valsangkar, A.J.	U.N.B. Civil Eng.	Soil Structure Interaction in Peats & Organic Soils	13,000 14,469 NSERC	82-83 83-84	

Vitt, D.H.	U. Alberta	Identification of Brophyte & Sphagnum Peat Moss Samples Collected During the 1982 Field Season	3,000	82-83	DSS/ENV
-----	---	Perform Peatland Ecology Field Investigations	10,400	82-83	DSS/ENV
Viraraghavan,T.	U.Regina Eng.	Peat Filtration of Septic Tank Effluent & Municipal Secondary Effluent	14,469	83-86	NSERC
Vreeken, W.J.	Queen's U.	1) Soil Variability in Lacustrine Clays 2) Stratigraphy of Bog Marl Deposits	5,400	77-78	NRC
-----	---	Soil-Geomorphic Studies Between Kingston & Trenton Ontario: Project 1) Soil Variability in Lacustrine Clays; Project 2) Stratigraphy of Bog Marl Deposits	3,410	78-79	NSERC
Walker, G.	U. Calgary	Flexibility Analysis of Gas Pipelines in Muskeg Areas	7,500 7,790 8,820	76-77 77-78 78-79	EMR
Waterhouse, J.	Memorial U.	Seasonal Flow in Channels Draining Peatlands	7,000 7,245 7,955	78-79 79-80 80-81	NSERC
Wilson, N.E.	McMaster U.	Geotechnical Properties of Organic Soils-Shear Strength & Consolidation of Muskeg	2,975	74-75	NRC
-----	---	Shear Strength of Soils, Especially Organic Soils	5,000	78-79	NSERC
Yong, R.N.	McGill U.	Efficiency of Tracked Vehicles on Marginal Terrain Including the Development of Snow, Muskeg, & Articulated Vehicle Computer Modules	59,200 240,772 204,144 35,667	78-79 78-79 79-80 82-83	DRB/DSS

VI

AN UPDATED BIBLIOGRAPHY OF PEAT RELATED RESEARCH

UPDATED BIBLIOGRAPHY OF PEAT-RELATED RESEARCH

4.6.1 PEAT RESOURCE INVENTORY

Agriculture Canada, Ottawa. Proceedings of the Canada Soil Mapping Committee Organic Soil Mapping Workshop, June 3-7, Winnipeg, Manitoba. Land Resource Research Institue, Agriculture Canada, Ottawa, K1A 0C6.

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APPENDIX A

STATISTICS ON PEATLANDS UTILIZATION

APPENDIX A WORLD STATISTICS ON PEATLANDS UTILIZATION

Table 1. Total areas and annual rates of drainage (reclamation) of peatlands for forestry and agriculture according to the IPS enquiry 1979. Unit: 1000 ha. (Reprinted from the Bulletin of the International Peat Society, No. 12, February 1981.)

	FORESTRY USAGE		AGRICULTURAL USAGE	
	Total area	Annual rate	Total area	Annual rate
Finland	4400	150	700	0.1
USSR	2660	250	c. 1000	38
Sweden	1000	20	200	1
Poland	120	15	960	4.5
FRG	50	0	900	0
UK	200	24	700	10
GDR	60	n.d.	480	8
Norway	350	3	150	3
Minnesota	0.5	0	266	1
Ireland	95	6	116	9.5
China	77	4	110	6
Canada	c. 100	n.d.	40	n.d.
New Zealand	0	0	75	1
Denmark	0	0	60	1
Switzerland	10	0	33	0
Czechoslovakia	7	0.5	10	0.3
Israel	0.3	0	6	0

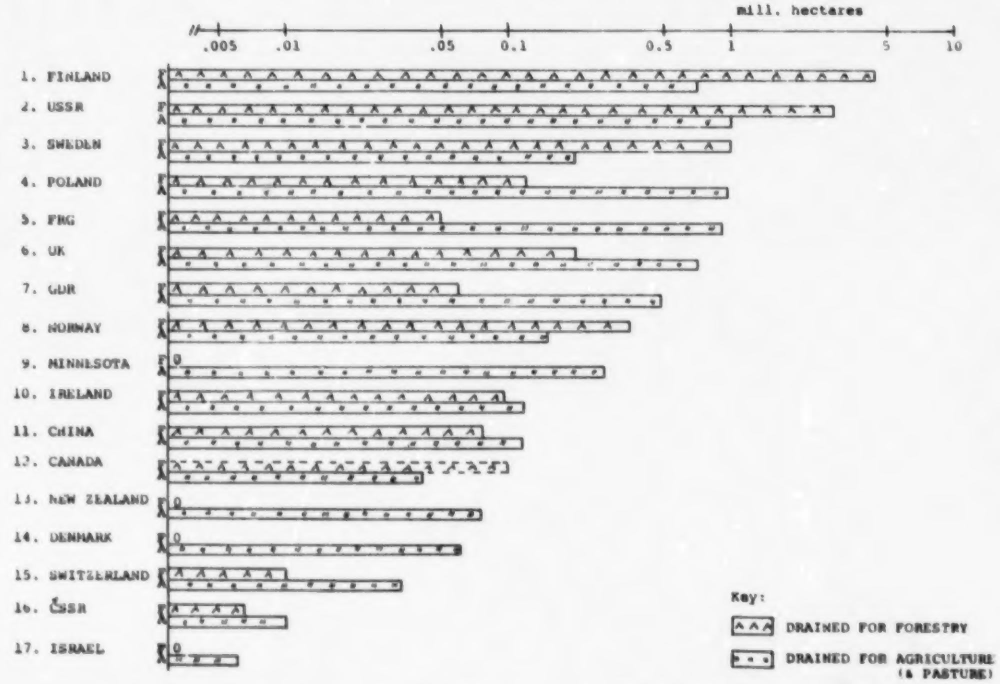

Figure 1. Ranking of the countries according to the total area of peatland used for forestry (F) and agriculture (A). Logarithmic scale used. (Reprinted from the Bulletin of the International Peat Society, No. 12, February 1981.)

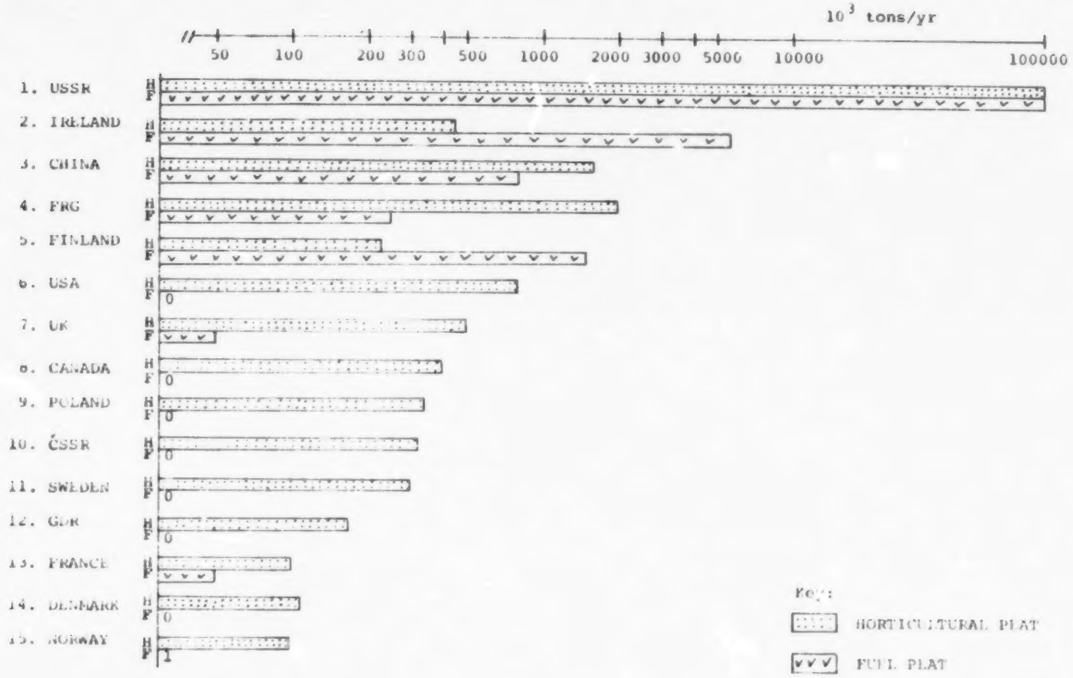

Figure 2. The production of horticultural peat (H) and fuel peat (F) in different countries. Unit: 1000 tons (incl. 40% moisture) per year. Logarithmic scale used. (Reprinted from the Bulletin of the International Peat Society, No. 12, February 1981.)

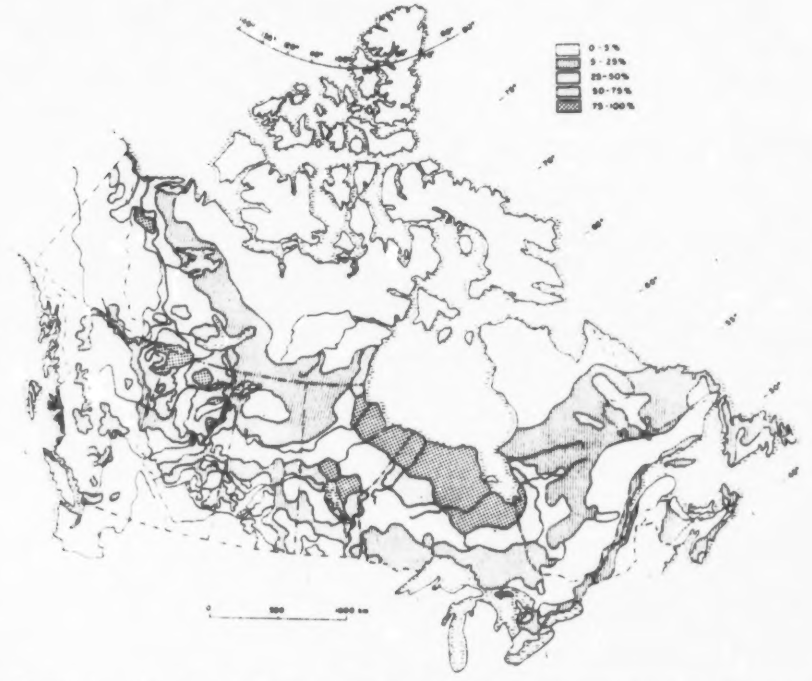

Figure 3. Distribution of Wetlands in Canada, expressed as percent (%) of total land surface. (Reprinted from "An Outline of the Wetland Regions of Canada" by S.C. Zoltai, Proceedings of a Workshop on Canadian Wetlands, Ecological Land Classification Series, No. 12, Land Directorate, Environment Canada. 1980. Reproduced by permission of the Minister of Supply and Services Canada.)

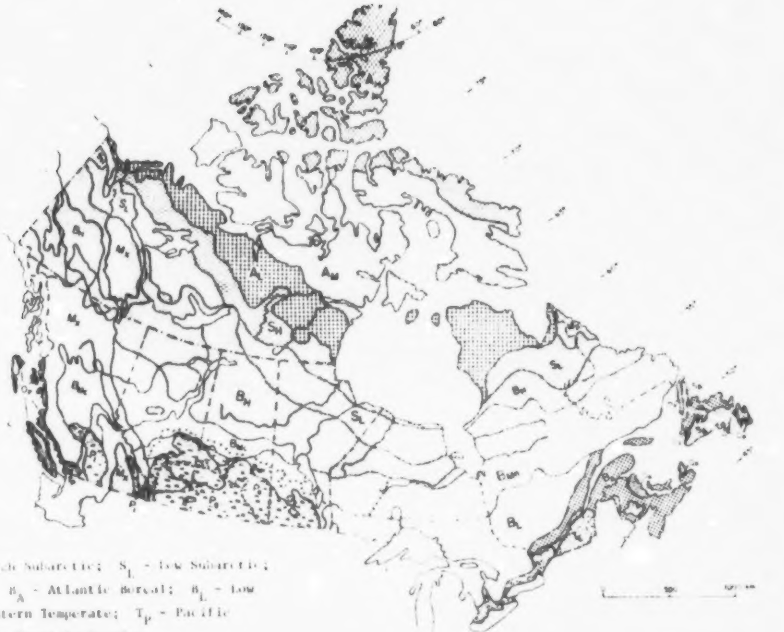

Figure 4. Wetland regions of Canada. (Reprinted with permission from "An Outline of the Wetland Regions of Canada" by S.C. Zoltai, Proceedings of a Workshop on Canadian Wetlands, Ecological Land Classification Series, No. 12, Land Directorate, Environment Canada. 1980. Reproduced by permission of the Minister of Supply and Services Canada.)

A_H - High Arctic; A_M - Mid-Arctic; A_L - Low Arctic; S_H - High Subarctic; S_L - Low Subarctic; S_A - Atlantic Subarctic; B_H - High Boreal; B_M - Mid-Boreal; B_A - Atlantic Boreal; B_L - Low Boreal; P - Prairies; P_I - Intermountain Prairies; T_E - Eastern Temperate; T_P - Pacific Temperate; O_A - Atlantic Oceanic; O_P - Pacific Oceanic; M_X - Mountain Complex.
Wetland Districts are identified by lower-case subscript (see text).

Table 2. Average temperature and precipitation ranges in the Wetland Regions of Canada[1] *(Reprinted with permission from "An Outline of the Wetland Regions of Canada" by S.C. Zoltai, Proceedings of a Workshop on Canadian Wetlands, Ecological Land Classification Series, No. 12, Land Directorate, Environment Canada. 1980. Reproduced by permission of the Minister of Supply and Services Canada.)*

Wetland Region	Mean daily January temp. (°C)	Mean daily July temp. (°C)	Mean annual total precip. (cm)	Mean depth of snow, Feb. 28 (cm)
A_H	-30 - -40	3 - 6	8 - 20	15 - 45
A_M	-30 - -35	4 - 10	10 - 20	20 - 50
A_L	-28 - -32	10 - 13	20 - 25	40 - 50
S_H	-26 - -30	10 - 16	25 - 35	40 - 50
S_L	-23 - -30	14 - 17	40 - 50	50 - 60
S_A	- 7 - -12	13 - 16	100 - 105	20 - 50
B_H	-18 - -23	14 - 18	30 - 80	45 - 65
B_{Mb}	-18 - -23	13 - 18	65 - 100	50 - 100
B_{Mc}	-15 - -23	16 - 18	40 - 65	30 - 50
B_L	- 7 - -18	18 - 21	60 - 105	40 - 100
B_A	0 - -18	16 - 18	90 - 130	40 - 75
T_E	- 4 - - 7	20 - 22	80 - 100	0 - 30
T_P	2 - - 1	18 - 19	100 - 150	0
O_A	- 8 - -10	10 - 13	100 - 130	20 - 50
O_P	4 - - 1	13 - 16	230 - 255	0
P_a	-12 - -18	17 - 20	30 - 45	15 - 30
P_g	-12 - -18	18 - 20	30 - 40	10 - 20
P_I	- 4 - - 8	18 - 20	40 - 50	30

[1] Source: Anon. 1962. The climate of Canada. In: The Canada Year Book, 1959-1960, Dom. Bur. Statistics.

Anon. 1973. The National Atlas of Canada, Dep. Energy, Mines, Res., Surv. Mapping Br.

Table 3. Estimates of Wetlands near Canada's major cities[1]

	Kilometres from Centre of City					
	0-8	8-16	16-24	24-32	32-40	0-40
City	Area in Hectares					
St. John's	219	415	572	1,394	2,135	4,735
St. John	294	851	632	888	1,432	4,097
Halifax	30	1,281	2,067	2,544	3,994	9,916
Quebec	0	2,221	3,478	2,465	1,430	9,584
Montreal	0	100	128	161	1,784	2,173
Chicoutimi	82	699	2	0	0	783
Ottawa	42	1,088	1,954	1,451	2,946	7,481
Oshawa	117	346	390	585	696	2,134
Toronto	0	0	26	0	270	296
St. Catharines	0	59	1,480	0	541	2,080
Hamilton	88	96	0	0	609	793
London	0	0	0	0	60	60
Kitchener	0	0	0	0	119	119
Windsor	0	365	191	714	69	1,339
Sudbury	664	1,205	2,188	1,743	1,866	7,666
Thunder Bay	35	26	202	168	418	849
Winnipeg	0	0	0	304	294	598
Saskatoon	0	149	261	426	350	1,186
Regina	0	0	130	407	543	1,080
Calgary	11	52	298	698	389	1,448
Edmonton	0	422	1,270	1,409	1,150	4,251
Vancouver	0	2,382	4,600	3,021	3,901	13,904
Victoria	102	323	314	20	326	1,085
TOTAL	1,684	12,070	20,183	18,398	25,322	77,657
% of Total Wetlands in Canada[2]	0.001	0.007	0.012	0.011	0.015	0.046

---

[1] Data compiled by C. Rubec, Lands Directorate, Ottawa. Wetland data were derived from the 1967 Canada Land Inventory Present Land Use, Class M (for Vancouver and Victoria, data refer to CLI land capability for agriculture, class O). The CLI figures do not include wetland sites less than 150 ha in area (the minimum mapping unit at 1:250,000 scale).

[2] Total area of Canada's wetlands is 170,000,000 ha.

APPENDIX B

1950 RECOMMENDATIONS ON CHEMICAL UTILIZATION OF PEAT

APPENDIX 1950 RECOMMENDATIONS ON CHEMICAL UTILIZATION OF PEAT

(From A Chemical Study of the Peats of Québec, J. Risi et al, Québec Dept. of Mines, 1950)

Chemical Utilization of Peat:

Using as a basis the total surface of bogs already surveyed in the Province of Québec (2), and assuming an average depth of eight feet, with a yield of a little more than a million tons of air-dried peat per square mile (14), the reserves of the Province can be evaluated at about 200,000,000 tons of air-dried peat. This figure is arrived at without taking into consideration the numerous large bogs which have not yet been explored. Because of the number of uses for peat and the valuable chemical products which it is possible to obtain from peat, this reserve constitutes an almost inexhaustible natural resource which should receive serious consideration by economists and industrialists.

The ultimate goal of the exploitation of bogs is to make available to agriculture, particularly to market-gardening, the immense accessible bog surfaces of our province. To achieve a sound domestic economy, the complete utilization of peat is a necessity. The superficial exploitation of peat moss, even if combined with drainage operations, does not attain this end. The complete extraction of the lower layers of more decomposed peat must be undertaken. Its utilization as fuel is not, however, easy in Canada because of the reasons previously mentioned. Only the chemical utilization of peat will satisfactorily solve this problem. The possibilities in this domain are numerous enough and sufficiently varied depending on the nature and the chemical composition of the peat.

The authors wish to give a short résumé of its principal potentialities so as to indicate future efforts which should be tried.

Peat as a combustible, as fuel for motors, as litter, and textile and fertilizing peat will not be discussed here. The peat distillation industry which furnishes products resembling those obtained form soft coal will only be mentioned. In this latter process, coke form peat and a tarry material, rich in important chemical substances, are obtained.

Since this industry is important in a number of European countries, it may be considered as well known.

On the other hand, brief mention will be made of other less frequently used chemical processes which need still more fundamental research before their industrial realization is a fact.

Extraction of Peat Rich in Waxes:

Certain peats could be used in the manufacture of waxes. These waxes would be obtained by using a suitable solvent such as benzene, carbon tetrachloride, carbon disulphide, etc. Wax form peat resembles lignite wax and possesses properties comparable to those of Montan and Carnauba waxes. Peat wax could be used in the manufacture of floor waxes, electrical insulating materials, coatings for cables, industrial emulsions, adhesives, pharmaceutical materials, also for rendering textiles impermeable and for the gluing of paper and wall-boards.

Hydrolysis of Peat Rich in Carbohydrates:

Peats, rich in cellulose, hemicellulose and pentosans, could constitute raw materials for industrial hydrolysis, which would consist in treating peat with dilute acid in an autoclave. Thereby, fermantable sugars could be obtained, side by side, with important proportions of acetone, furfural, and certain aliphatic acids. Lignin and the humic acids, which would pass into the residue, could also be transformed into useful products.

The sugar-containing liquor could then be made to undergo an alcoholic fermantation yielding ethyl alcohol or the butanol-acetone fermentation which would give such important industrial products as acteone and butyl alcohol.

The same liquor could also be subjected to a lactic acid or, lastly, to an aliphatic fermentation which would give a mixture of different fatty acids, ranging form acetic acid to valeric acid, subsequent distillation of which would permit the formation of many important ketones.

The total utilization of peats thus could furnish millions of gallons of industrial alcohol, without counting the other products of great value previously mentioned.

In addition, the use of sugars from peat as organic substrata for the culture of yeast (Saccharomyces or Torulae) would permit the production of an edible yeast, rich in vitamins and protein, for use as cattle food.

This latter, during the long Canadian winters, would be of great importance because it could restore to more profitable crops large agrarian surfaces now used solely for hay production. In the same way, sugars in peat could be used for the production of an excellent quality of fodder molasses.

Utilization of Peat Rich in Lignin:

Peats, rich in lignin, and lignin obtained as a secondary product of the hydrolysis of peat, could serve as raw material in the fabrication of plastics, vanillin (an aromatic substance used in the preparation of ice cream, confectionary, etc.), detergents, wetting agents, industrial emulsions, compressed fuel of the briquette type, or construction materials possessing high mechanical resistance. An important line of application is open to lignin in the field of industrial carbons, carbon for electrodes, and activated carbon because of the almost complete absense of ash and tarry materials. It might also be possible that coke coming form peat lignin, conveniently treated, could replace petroleum coke, which has become rare, in many metalurgical processes.

Catalytic hydrogenation of lignin form peat would permit the industrial preparation of important industrial alcohols and derivatives of cyclohexanol which could be used as solvents, plastifying and lubrifying agents, and motor fuel. Motor fuels could also be obtained by alkaline pyrolysis of peat.

Utilization of Humic Acids from Peat:

Old type peats, rich in humic acid, because of their undeniable fertilizing properties, could eventually serve as the basis of compost. These peats could also be used in the compounding of certain paints and dyes, as substitutes for caramel in the food industry, in polishes and waxes, industrial emulsions, catalytic supports, insecticides, and especially in valuable tanning substances which would permit the one-bath tanning of hides.

Other Uses of Peat:

Making use of the excellent insulating properties of peat, it should be possible to convert peat into wall-board and other inexpensive insulating materials by an appropriate treatment under pressure with different adhesives or plastifying agents. In the construction field alone, the uses of peat, conveniently prepared and treated, are almost unlimited.

In addition to preparing a systematic inventory of the principal peat bogs of Québec, it is proposed, with the consent of the Honourable C.D. French, Minister of Mines, to undertake fundamental research towards a more rational utilization of this important resource.

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APPENDIX-C

CANADIAN NATIONAL COMMITTEE - INTERNATIONAL PEAT SOCIETY

MEMBERSHIP APPLICATION FORM

APPENDIX C

T.E. Tibbetts
Sec. Treas. CNC-IPS
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Natioal Research Council Canada
1411 Oxford Street
Halifax, Nova Scotia
B3H 3Z1

Membership is hereby requested in the Canadian Natioal Committee International Peat Society as:	Je désire adhérer au Comité national canadien - société international de la tourbe comme:

Organization Member ( ) Organisme-membre
Cost...$125.00...Coût

Individual Member ( ) Membre individuel
Cost...$ 15.00...Coût

Title/Titre ....
(Prof./Dr./Mr./Mrs./Ms./Miss) (Prof./Dr. ès sc./M./Mme./Mlle.)

Name/Nom ....
(Surname/nom de famille) (Given names/prénoms)

Organization/Organisme ....

Address/Adresse ....
(Street/rue, etc.)

....
(City/ville)

....
(Province) (Postal code/code postal)

Nature of Business/Sorte d'activités ....

Date .... Signature ....

POOR

QUALITY

ORIGINAL